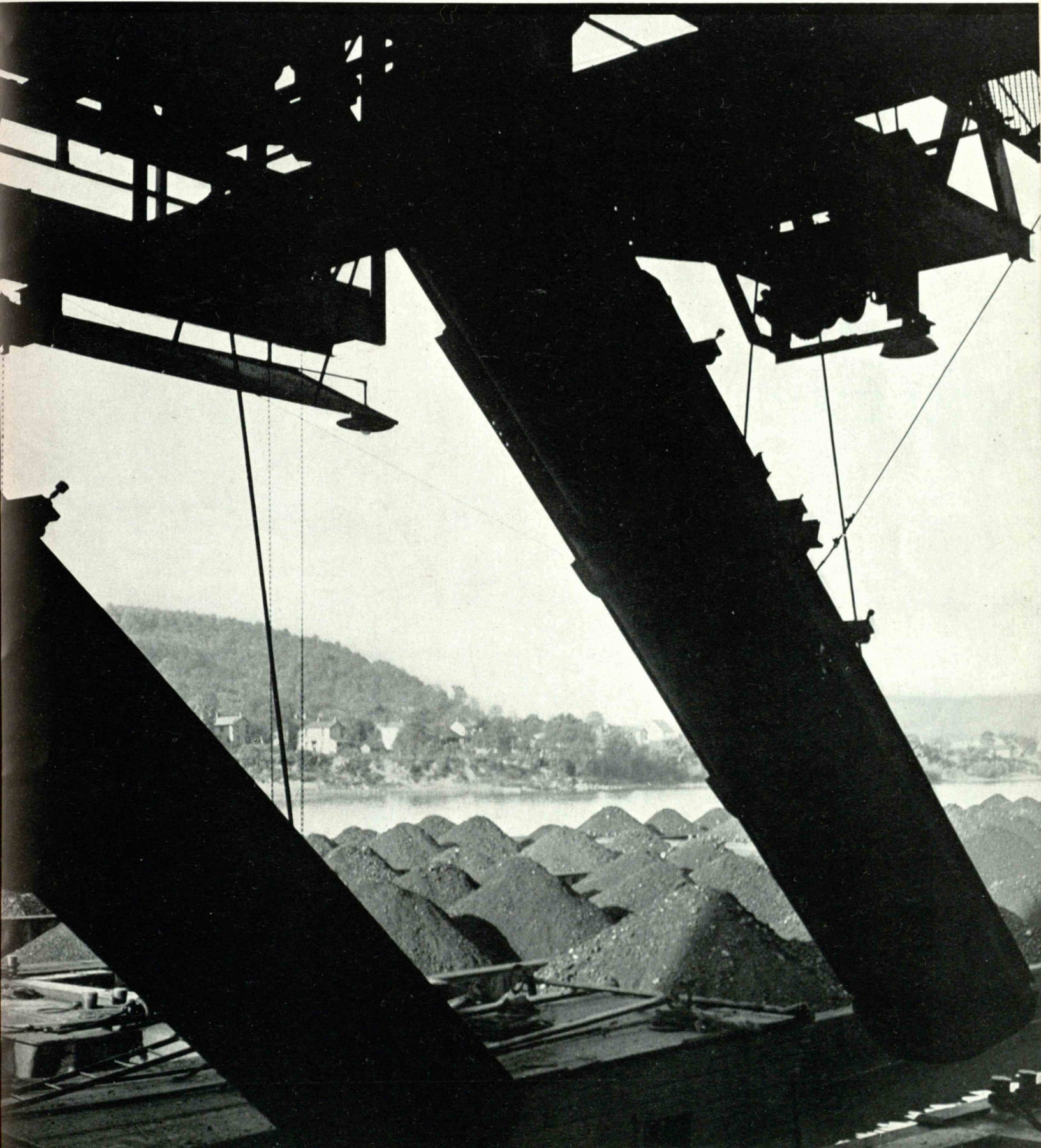


May 1939

TECHNOLOGY REVIEW

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technology review

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THE TABULAR VIEW

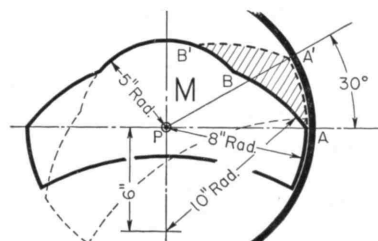
FORTUNATE among their compeers in periodical journalism are alumni magazines, for they naturally find among their readers interest and responsiveness of a degree which many publishers must carefully and deliberately cultivate. This relationship of Review readers to their magazine meets frequent tests, when The Review quizzes them on one subject or another. Most recent appeal to readers in general was the housing questionnaire, response to which was reported in our March issue. A special group have now been called on to aid and abet; that they have done so with vigor and verve equaling the earlier general response is indicated in this issue's account (page 302) of Technology participation in the design and construction of the expositions with which East and West are signaling 1939. The story was, perforce, written by the long-distance, remote-control technique, relying for content upon the coöperation of Alumni who used the snowball-rolling-downhill method of accretion in supplying facts. Thus a sort of mutual dragnet got into operation. If some Alumni escaped its sweep, to them an anticipatory apology is offered. To the members of the dragnet The Review here presents its thanks, with an especial gesture in the direction of Messrs. Walter D. Binger, '16, Joseph L. Hautman, '25, and William H. Latham, '26.

DR. W. V. QUINE, a member of the department of philosophy at Harvard University, serves Harvard's department of mathematics as well through the graduate study which he conducts in mathematical logic, a field in which he is recognized authority. Vice-President of the Association for Symbolic Logic, Inc., and a consulting editor of the *Journal of Symbolic Logic*, he has written widely on the topic in scholarly publications. His first consideration of it in lay terminology is presented on page 299. At Technology, as Dr. Quine reports, a start has already been made on exploitation of the techniques which mathematical logic offers to scientist and engineer alike. ¶ Far places and arduous ways of getting there have long since exercised on RICHARD HALLET a fascination which he has turned to account not only in fiction which Review readers will remember in the *Saturday Evening Post* but also in his recent book, "The Rolling World." In this issue (page 307) he elaborates from the engineering point of view upon his experiences in Australia some quarter of a century ago. ¶ To the Trend of Affairs this month The Review welcomes FRANK N. HOUGHTON, '22, sometime member of the Department of Economics and Social Science, who now, though not himself a lawyer, is in charge of patent matters for Arthur D. Little, Inc., in coöperation with attorneys. His discussion of current advocacy of modification of the American patent system appears on page 298. ¶ The Cover Club greets as new member this month FREDERICK G. SKEYHAN, '24, of Akron, Ohio, whose sense of composition and suggestion found the values inherent in coal barges on the Monongahela River.

No. 16

Just for Fun! A CHALLENGE TO YOUR INGENUITY

HERE is a problem you can solve easily in your head — if you approach it properly. [We met it in a pump flow analysis.]



Member M, pivoted at P, is rotated 30°, thus causing its curved edge AB to advance to the position A'B'. From the specified data, show that the shaded area AA'B'B represents about 10.21 square inches.

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MAIL RETURNS

Bombers for Defense

FROM LEWIS N. OMAN:

One question which has puzzled me hasn't yet been answered. Captain Frederic E. Glantzberg's article in your April issue gives me a chance to bring it up again in a new place. It is a question concerning the defense of cities against air attack. I do not mean, however, air attack by what might be called a "live" plane loaded with bombs and flying by its own power on a course set by its own pilot. I mean air attack by a "dead" plane, which I would define as a plane that has been disabled by gunfire from an antiaircraft battery. It is still flying, but this time by the power which it got from a wallop from a shell fragment, and it is on a course set for it by the explosion that killed its pilot. Maybe its bombs were detonated by the shell fragment. If they were, the plane itself might be a menace to people in the thickly populated area into which it is falling. If the bombs weren't exploded, some of them will probably go off when the wreck of the plane hits the ground. If so, it hasn't done much good to knock the plane out of the air. I don't say anything about the shower of shell fragments that are bound to drop back into the city from a height of two or three or more miles as a result of the fire of the city's own antiaircraft batteries. But it seems to me that in these two things are two more arguments to back up Captain Glantzberg [27] when he says that the best defense against a bombing plane is a better bombing plane.
Pittsburgh, Pa.

From Long to Short Waves

FROM DONALD G. FINK, '33:

A slight correction should be made in a statement in my recent article, "From the Mountaintops" [April Review]. The statement is made on page 258: "Using this region [ultrashort wavelengths] of the spectrum, Major Armstrong devised a system of transmission. . . ." Major Armstrong advises me that the system he devised was originally developed on conventional long waves and operated successfully by him in that region of the spectrum. Later the system was placed in the short-wave region for the most practical use to be made of it.
New York, N. Y.

Disagreement

FROM NATHAN E. PERSSON:

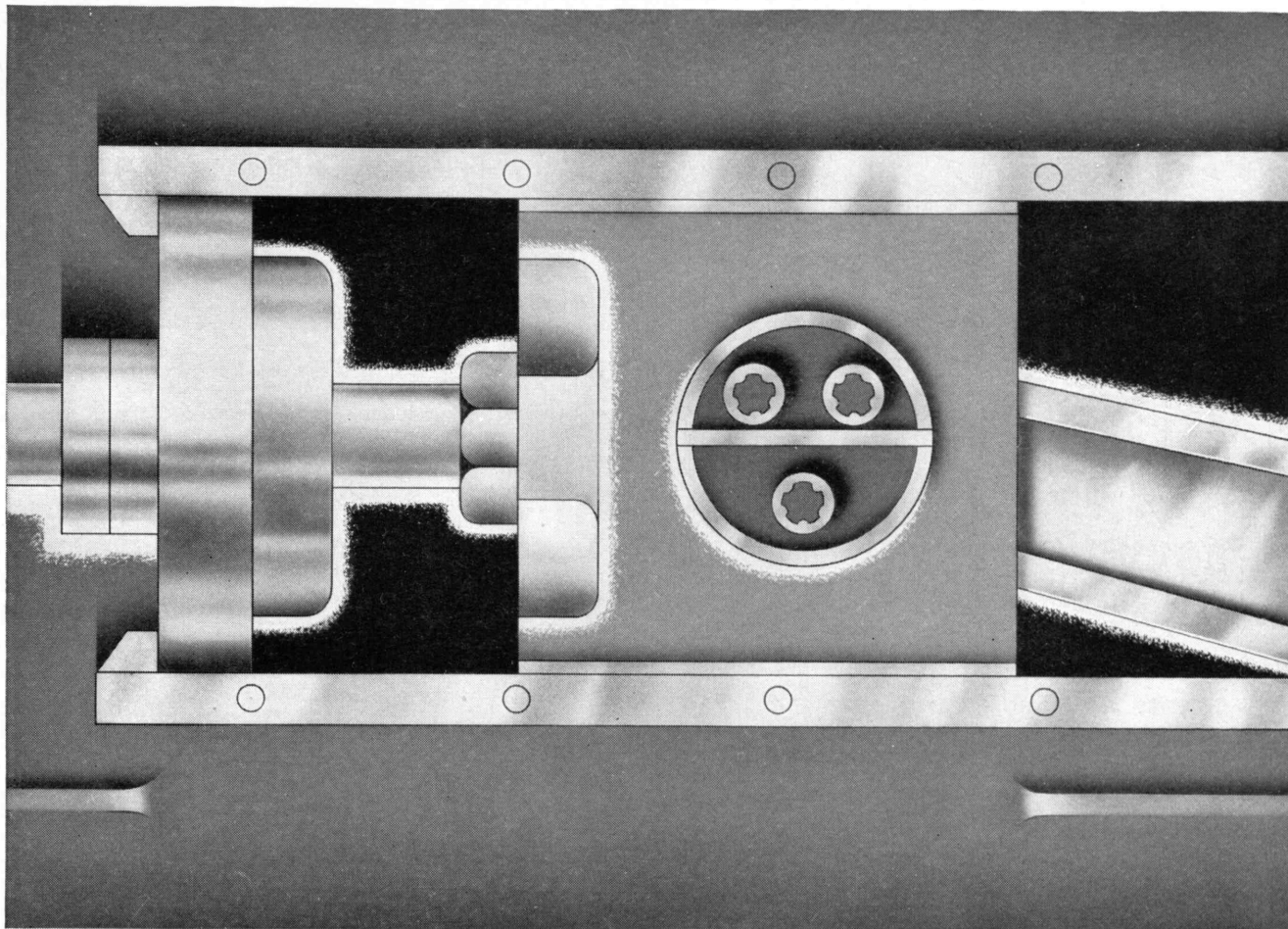
Your correspondent, Eve Withers [April Review, page 238], is, it seems to me, altogether too sharp in what she has to say about how people talk about their houses. I think she has left out one step in her reasoning, in what might be called characteristically feminine fashion. It is always easy to get a harsh conclusion if you ignore facts when the facts might prevent your arriving at your preconceived goal.

She talks about the "great difficulty, if not the downright impossibility, of escaping from the house itself anyway." As if anyone wanted to escape from it! Or ought to be expected to want to escape from it! If a man works like a trooper to get some land and get a house built on it — cheese-box Modern or tweety-tweety Olde American or even gingerbread Victorian — and then continues working like a trooper to keep ahead of his mortgage and the uprising tax rate, why in the world ought he to want to escape from the house? The poor fellow is naturally more concerned about it than he is about almost anything else in the world. What if he can't talk about much else? When you take a look around these days, most subjects which might be made the center of conversation are so likely to end necessarily in a free-for-all over some kind of an ism or ology that you can't blame people who are content to talk about a decently manageable subject, especially if it is close to their hearts. And it is likely to be close to their hearts because it is pretty sure to be mighty close to their pocketbooks.
Bangor, Maine

Modern Again

FROM WILLIS HENLEY, '37:

"It is precisely on the plan and on austerity or simplicity of detail that Modern rests its case," you say in mentioning reader response to Modern architecture in the interesting housing survey presented by your March issue [page 210]. To this I reply: "So?"
Wilkes-Barre, Pa.



MAKING PRODUCTION DOLLARS S-T-R-E-T-C-H

The simplification or elimination of fabricating processes is one way of making production dollars go farther. Molybdenum steels are often a help in that way.

For instance, a manufacturer of high pressure motor driven pumps uses cast Nickel-Molybdenum steel for cross-head guides because it has the required toughness and hardness. In addition, the ready machinability and close grained structure of the steel make it possible to produce a good bearing surface in the

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Living up to the Greatest Name in Rubber

The Mile-Long CONVEYOR BELT

ENGINEERS all over the world are gleaming new ideas today from a spectacular achievement in Goodyear rubber—the world's longest conveyor belt now in service at Grand Coulee Dam. Twice as long as any belt ever built, it is a goliath of rubber 9,700 feet in length, 48 inches wide, weighing 80 tons. This veritable rubber railroad carries an endless load of stone aggregate—two thousand tons every hour—for a mile-long ride from screen house to dam site at lower cost than any other transport method. It opens a new era in the economical handling of bulk materials.

Never before has so large a single unit of rubber been built for any purpose. Its huge bulk involved strains and stresses of tremendous magnitude; ample safety factors had to be provided. Into its design went all the knowledge Goodyear has gained in building belts that hold the world's record for tonnage in other operations. Its successful performance bespeaks the skill of Goodyear Technical Men and Goodyear's great research laboratories in developing rubber to serve any task. It is one more evidence of Goodyear's stewardship of the greatest name in rubber.



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—equipped with 9,700 feet of Goodyear conveyor belting; operates on centers 4,835 feet apart; travels 450 feet per minute; carries 2,000 tons per hour.

1839 • THE CENTENNIAL OF RUBBER • 1939

Great beyond all other names in rubber is that of Charles Goodyear—discoverer just a century ago of the process of vulcanization that made rubber usable to mankind. To honor him The Goodyear Tire & Rubber Company was named long after his death; from his lifelong effort to extend rubber's utility it takes inspiration, and seeks by serviceability to deserve his name.

THE GREATEST NAME  IN RUBBER
GOODYEAR



Caribbean
Sunset

THE TECHNOLOGY REVIEW

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Henry B. Kane, '24

DOPEY

A white-footed mouse in the 13th day of his age

THE TECHNOLOGY REVIEW

Vol. 41, No. 7



May, 1939

The Trend of Affairs

Putting Noise to Work

MAN has long depended upon his eyes for control of various industrial processes and upon his ears for many others, but the versatile and unprejudiced photoelectric cell has taken the place of the human eye in the control of many manufacturing operations; now comes an electric ear to hear and act upon variations in industrial sounds.

Just as we hear and instinctively react to various sounds encountered in daily life, so skilled industrial workers learn to judge and control operation of machinery in many manufacturing processes by variations in noise level. In the thunder of stamp mills treating gold ore, in the clatter of automatic looms, in machining operations, the roar of industrial fans, the hum of motors, the flow of liquids, and in countless other industrial processes the slightest variation in sound has a meaning to the knowing ear. But the human ear is not always a reliable detector, and long experience is required to understand the language of some sounds. Thus an alert electric ear which hears with unvarying accuracy has much promise.

The electric ear was developed for the control of ore-grinding machines of the ball-mill type and reacts to the characteristic noise of these grinding machines instantly. This remarkable instrument automatically maintains the noise level of the mill by controlling the rate at which material is fed to it. If the noise drops an infinitesimal amount, the ear causes the rate of feed to be reduced, but should the noise increase above normal level, the rate of feed is automatically increased.

The "ear" itself is a microphone, with a sound-insulated back, located close to the mill. The "brainwork," or control, which translates messages from the ear into action of the feeder mechanism is contained in a cabinet which can be located in any convenient out-of-the-way

place. A single dial on the panel of the control cabinet adjusts the optimum noise level for the mill and thus fixes the loudness at which the automatic relays will increase or decrease the volume of material being fed to the machines. The electric ear is responsive to very small changes in noise level and can be applied to either wet or dry grinding. Fineness of the output can be altered at will, and overloading of the mill will still be guarded against even though the size and hardness of the feed vary.

The efficiency of the electric ear for control of grinding operations suggests the possibility of applying the method in other industrial processes in which variations in noise are closely related to efficiency of operation.

New Glass for Old

DROP a nine-ounce steel ball 28 feet onto a sheet of safety glass like that in your automobile windshield, and the ball will plunge through, breaking the pane into pieces. Substitute for the ordinary safety glass a sheet of the new high-test flexible glass and drop the ball again. The pane will bulge and crack under the impact, but the ball will not pass through.

With this and other convincing tests, the Franklin Institute recently introduced the result of a \$6,000,000, six-year research program conducted jointly by five companies to develop a softer, safer safety glass. The secret of the new glass is a filler of polyvinyl acetal resin, a plastic that is much stronger and more elastic than the cellulose nitrate and cellulose acetate plastics previously used in laminated glass.

Almost simultaneously with the demonstration of this new achievement in the combined technology of glass and plastics, Dr. George W. Morey of the Carnegie Institution of Washington patented a method of making optical glass that yields lenses with the highest index of

refraction (light-bending power) ever reported — more than 2.00. Made from such rare elements as yttrium, lanthanum, and strontium, instead of silica, the optical glasses of Dr. Morey promise lenses of greater light-gathering power, fewer limitations for the lens maker.

These are but two of many recent demonstrations of what science may do, not only in confecting synthetic materials but in improving old ones. The World War found American industry unable to make high-grade optical glass, and only furious efforts by the Bureau of Standards and the Bausch and Lomb Optical Company made available to us glass approaching the quality of that produced by German manufacturers. Since then, our glass technology has steadily forged ahead, and we have witnessed a remarkable procession of new products ranging from record-sized telescope mirrors, glass bricks, glass yarn, and glass insulation to the superb Steuben museum pieces designed by Sidney B. Waugh, '27.

Back of these achievements have been physicists and chemists probing the challenging mystery of glass's structure. As *The Review* reported in its April, 1937, issue (page 237), the physicist is just beginning to understand how molecules and atoms link themselves together to form the anomalous material we know as glass. Out of this understanding will come an even greater versatility for an old material kept young by science.

Gold by Charcoal

EQUIVALENT to finding new resources of gold is a new and simplified process for the removal of that metal from ores which hitherto have been discarded or ignored because of the great expense, and even impossibility, of extraction of the gold. The method which was developed by Thomas G. Chapman, '09, professor at the University of Arizona, carries out two distinct processes simultaneously. It consists of dissolving the gold from a finely crushed ore with cyanide and, at the same time, allowing the dissolved gold to be adsorbed by activated charcoal. This procedure concentrates the gold in the carbon, which then may easily be isolated by flotation, and the gold may be removed from it by smelting.

Older methods of gold extraction have used cyanide to dissolve the mineral, but the gold has always been reclaimed from such solutions after they

have been separated from the ores by filtration or decantation. Since the gold is removed from solution by the charcoal as fast as it is dissolved by the cyanide, the concentration of gold in solution is always low, and therefore the solution has a great affinity for more gold from the ore. Another advantage is the minimum possibility of the gold's being adsorbed by the constituents of the ore rather than by the charcoal. The combination of two operations — dissolution and adsorption — lends simplicity, simplifies the method of recovery. Thus the disadvantages of former processes, such as the necessity for allowing particles to settle, nonuniformity of filters, and the need for washing away the pregnant solutions, are circumvented.

The new method can be applied to certain ores which have long presented obstacles to the extraction of their gold. Ores containing graphite have offered difficulties to the metallurgist because the graphite, adsorbing the gold from solution — as does the charcoal in the new method — opposed the removal of gold from solution by the leaching methods. In the new process, the graphite acts in the same manner as so much additional charcoal

Underpass serving the Triborough Bridge, New York City

Paul J. Woolf



and assists, rather than hinders, the process of recovery. Gold closely associated with sulphides in ores has often defied solution and therefore has not been extractable by leaching and filtration methods. Experiments with the new method indicate that such gold can be extracted because the sulphides float with the charcoal.

In the treatment of low-grade ores and tailings from other extraction methods, about two pounds of charcoal are required to a ton of ore. With higher-grade materials three to seven pounds of charcoal to a ton of ore are needed.

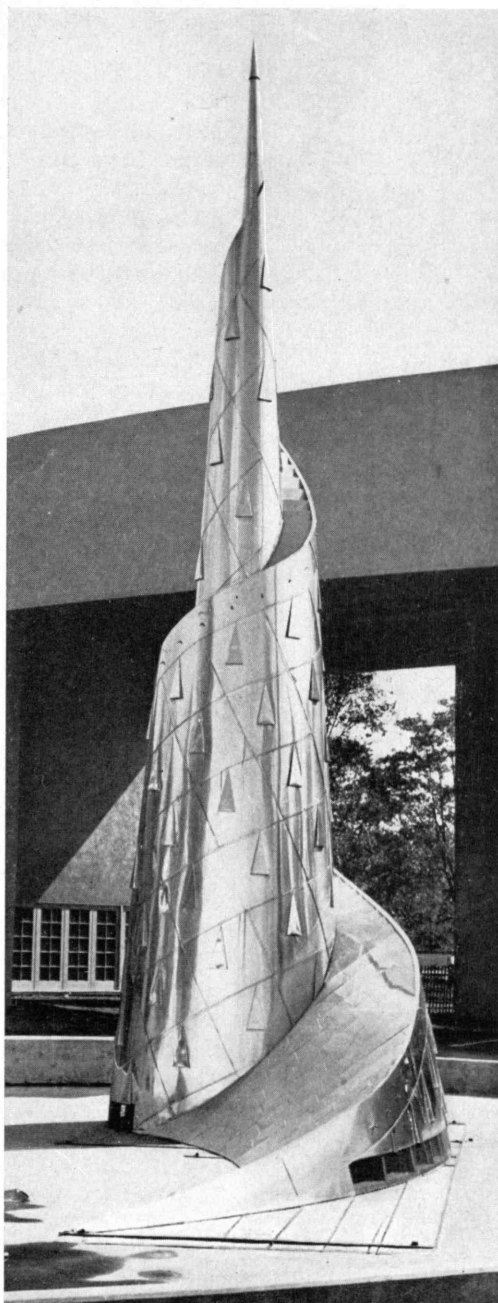
Engineers Speak Out

THAT engineers are strong, silent men is a cliché old enough to be useful and understandable even to Hollywood. That they are honest seems likewise assumed by the moguls of entertainment. Can you recall any engineer, in literature, on the stage, or on the movie screen, who occupies a role of villain? Frederic A. Allner raised this question at a public forum of the American Engineering Council, and no one apparently challenged it.

It was not the engineer's honesty, however, that Mr. Allner wished to emphasize; it was his traditional silence, his slowness in accepting a professional responsibility to contribute to the discussion of public questions. The engineer is a prime fact-finder, yet his reluctance to bring his facts to public attention explains in part Owen D. Young's observation that "fact-finding is one of the least developed of America's national resources."

The public forum at which Mr. Allner spoke represents an effort to make the engineer more influential and vocal. So far, two forums have been held — one in Philadelphia devoted to "Technology and Competition" and one in Detroit discussing "Invention and the Engineer's Relation to It." All of the forums seek to bring industrialists, economists, and engineers together in order "to take stock and discuss trends in our present-day civilization with particular reference to specific problems."

These programs are an apt addition to the activities of the American Engineering Council, which has sought for 18 years to foster clear thinking on public questions



This fountain of stainless steel at the New York World's Fair 1939 was designed by Michael L. Radoslovich, '26. The court in which it stands is flanked by exhibits relating to science and education and to medicine and public health

among engineers and to serve as an effective agency for the presentation of the engineer's point of view. We commend the forum plan and foresee it as contributing to the professional spirit of engineers at the same time that it renders a public service.

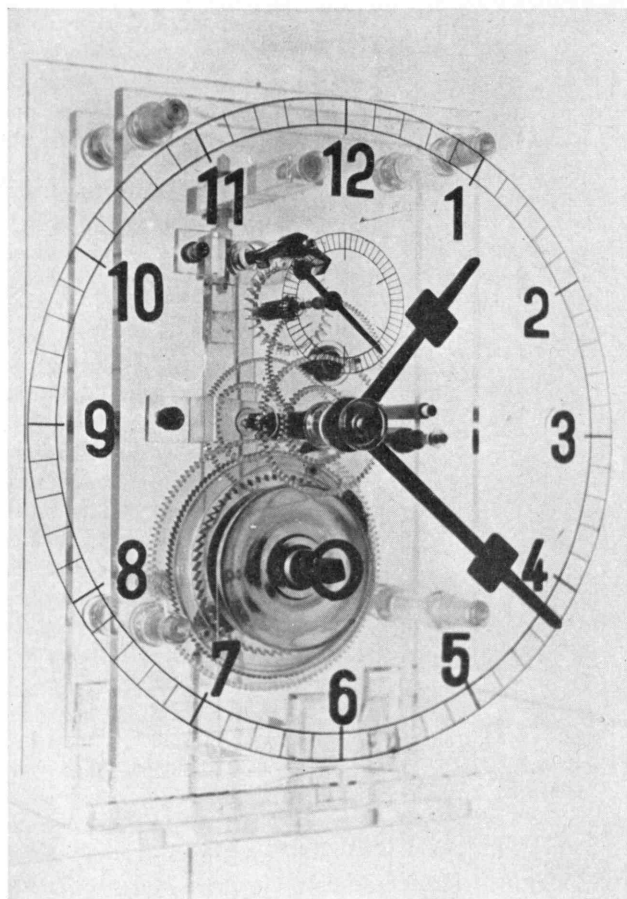
Dream Come True?

AMERICA'S dependence upon foreign sources of supply for her resources of rubber has irked more than one thinker. Thomas Edison's efforts to perfect ways of commercial extraction of rubber from native plants are among the most noted results of this fact. A basic necessity in peace and war, rubber may conceivably cease being a supply hazard as a result of two researches lately reported. One of these would synthesize the substance by the vapor treatment of sulphur; the other would extract it from the Castilla tree — native to South America but cultivable on this continent — by the tremendous pressures available in the horn-angle machine developed by Matthew J. Stacom. Each of these possibilities results from a long program of investigation carried on through many years with little or no fanfare.

A group of University of Alabama scientists have been investigating subjects in the industrial fields of dyes, plastics, and synthetic rubber for a decade, one of their objectives being to prepare complex organic compounds directly by treating elements such as sulphur with the vapors of simple, cheap organic compounds. One substance thus synthesized which they described to the American Chem-

ical Society is a rubberlike mass created from sulphur and chlorobenzene at temperatures of 240 degrees to 260 degrees C. This substance, it is hoped, may provide industry with a new type of synthetic rubber possessing properties unavailable in other rubbers and permitting a number of applications for which types of rubber currently on the market are not adapted. The rubberlike properties of the new substance are lost when it is melted but regained upon precipitation with an acid.

The Castilla tree, which replaces goldenrod in the second possible answer to Edison's quest for a native rubber, has for a long time been known to contain



L. Rozsa from Black Star

No hiding place for a mouse, this transparent clock makes time pass all too visibly. It is constructed entirely of synthetic plastic which may be dyed — as parts of the clock are. About one-third the weight of glass, the material — Plexiglass — is tough and transparent

rubber. Its nature, however, is such that the rubber which it contains could not profitably compete with plantation rubber. The enormous pressures afforded by the horn-angle machine — of the order of 100,000 pounds to 140,000 pounds to the linear inch — are expected, however, to make commercial extraction of Castilla rubber economically feasible, in part because they will make the tree yield not only rubber but also various other products in demand by the automobile and airplane industries and by the manufacture of plastics. The Castilla tree can be grown successfully in Florida, which fact would assure a United States supply.

The horn-angle machine — reported by *The Review* in June, 1937 — was devised by Mr. Stacom, a self-taught engineer, after years of seeking ways to improve methods of cellulose extraction. It secures phenomenally high pressures through application of the horn angle — the angle formed when two or more curved lines branch from a common stem. Such an angle is formed when one cylinder is placed inside another cylinder, in contact with it along one line. If steel cylinders of proper diameters are placed inside each other to form horn angles of definite sizes, and if the cylinders are rotated simultaneously in the same direction, giving a correlated effect of horn angles operated in different planes, extremely high pressures are obtained.

On the Medical Front

CIVILIZED man is an ironically ingenious fellow in that the faster he progresses in civilization, the faster he seems to develop lethal weapons and the desire to use them on his mates, whilst, at the same time, he emulates the Red Queen in traveling faster and faster in cutting down the danger of death due to disease. On the medical front of late, a group of encouraging developments can be reported, possibly as a partial offset at least to some of the gloom surrounding the political and economic fronts.

The versatility of sulfanilamide may, it appears, experience further extension through the fact that in combination with a fat component of coconut oil it has been found to prevent the growth of tuberculosis germs in test tubes. Moreover, it checks the disease from developing in guinea pigs inoculated with large doses of a human strain of the bacillus. Drs. M. L. Crossley, E. H. Northey, and M. E. Hultquist, reporting their work to the American Chemical Society, emphasized the fact that thus far they have been concerned only with animals, and that no conclusion is as yet permissible regarding the efficacy of the new compound in the treatment of disease in man. The tubercle bacillus wears a wax armor plate which the new drug is able to penetrate. The bacillus of leprosy likewise is sheathed in a waxy coating; it is hoped that the new chemical may prove efficacious against this foe also.

A chemical kinsman of sulfanilamide — sulfapyridine — has been put to work on pneumonia and has produced remarkable results, cutting the death rate from this disease at the Johns Hopkins Hospital by two thirds. Similarly sweeping results are announced from Montreal and Toronto. Dr. Perrin H. Long of the Johns Hopkins School of Medicine, reporting to the American College of Physicians, stressed the great importance of early treatment, maintaining that almost all deaths from pneumonia could be prevented if the sulfapyridine treatment could be started on the first day of illness. The drug appears to slow down the action of the pneumonia germs enough to give the patient a chance to build up resistance to them and thus to recover. The economic value of commencing sulfapyridine treatment on the first day of illness is indicated by the fact that it costs about \$12 to treat a case of pneumonia by this means, as against some \$75 involved in the serum treatment.

In the pulmonary sector one further engagement — that of medical research against silicosis — appears to be approaching successful termination. Two years ago J. J. Denny, metallurgical engineer, Dr. W. D. Robson, mine surgeon, and Dr. D. A. Irwin of the University of Toronto reported to the Academy of Medicine, Toronto, that inhaling aluminum dust had remedial effects on silicosis, the disease which results from inhalation of silica dust and which produces fibrosis of the lung tissues. The Canadian researchers have kept on with their study of the treatment on rabbits during the past two years, substantiating their earlier findings, explaining how the aluminum dust prevents silica and quartz dust from damaging the lungs, and showing that some quartz dust already

inhaled may be gradually removed from the lungs as a result of this treatment with the aluminum powder. The aluminum is dissolved by body fluids into a colloidal aluminum hydroxide jelly which is adsorbed and firmly held on the surface of the quartz particles, sealing them up so that they cannot go into solution and thereby poison the body tissues. The fibrosis caused by silica dust results from the poisoning of the phagocytic tissue cells of the body; this is prevented by the aluminum, and, as a consequence, these scavenger cells are able to carry away the silica dust sealed up in a nonirritating aluminum hydroxide envelope. Injecting the aluminum dust into the veins or feeding it does no good; it must be inhaled.

Whether civilization is itself a disease, as Dr. George Crile has intimated it might be called, it is productive of a special group of ills — the diseases of civilization — prominent among which is heart disease. To this group Dr. J. G. Lyster of Jacksonville, Fla., would add extreme mental upsets: the excitations, intense emotions, despondencies, depressions, fear reactions, and suicidal tendencies which so often disrupt life. Their importance, he held, is demonstrated by the fact that mental patients occupy more than half the hospital beds in the United States. To development of the prefrontal lobes of the brain in man, Dr. Lyster told the Southeastern Surgical Congress, many of such troubles are apparently due. Cutting nerves through which electrical impulses run from the forebrain to the rest of the brain has been found to allay such difficulties. Dr. Lyster described a new operative technique by means of which the surgeon is enabled to see what he is doing and which in 26 cases has resulted in quieting extreme nervousness, sleeplessness, suicidal intentions, worry, agitation, and hallucinations.

Heart trouble may be attacked by a similar technique, Dr. Crile told the same congress. The abdominal brain — a mass of nerve fibers known as the coeliac ganglion,

which lies just below the lower end of the breast bone — controls the action of the heart, digestion, blood pressure, and to some extent the activity of the head brain, as well as of other organs. Operation on it, cutting nerves from the ganglion to the organs in order to interrupt electrical stimuli and thus slow down their activity, is not new. Dr. Crile maintained that general application of the operation is the answer to the problem of heart disease in the United States, a problem which he called colossal because heart disease is the principal cause of death in this country.

Aspects of the 18th Century

NATIONAL boundaries, racial and ideological enclaves, and the other demographic and demagogic concepts which bother the world so much in these days are, fortunately, not to be found in the commonwealth of science, for unless it is universal, science is a contradiction in terms — contemporary closing of laboratories to subjects of dictator nations notwithstanding. If despite such arguments to the contrary we require inclusiveness of science in the present, it is hardly too exacting to ask an equal inclusiveness in the record of past science. As history itself should, ideally, bar no useful or significant fact, and as science takes unto itself whatever it can profitably use, regardless of origin, the history of science may all the more be looked to for completeness.

Commentary on history and the history of science, by the same token, should eschew the nationalistic, the parochial. But if in order to do so it passes over errors of omission which seriously affect an otherwise excellent book, it is poor commentary. Errors of omission are about the only great defect which can be alleged against Professor A. Wolf's monumental "History of Science, Technology, and Philosophy in the Eighteenth Century." * Able and clear in plan, exact and interesting

* New York: Macmillan, 1939. 814 pages, \$8.00.

Peggy's Cove, Nova Scotia — typical of south-shore fishing villages



C. H. R. Mable

in presentation, Professor Wolf's survey of the Age of Humanism is encyclopedic in content — if we ignore the fact that it appears to have been written upon the bland assumption that during the 18th Century nothing but red Indians, Thomas Godfrey, and Benjamin Franklin was to be found west of the Atlantic.

In the 18th Century the North American continent was, of course, preoccupied with the laboratory preparations for what appears to be the only long-term successful democratic experiment yet on record. Naturally enough, to the men who lived in that century and to the historians who have written of it since, its main theme of revolution and the rights of man was and has been chief concern. Consequently it has been all too easy in the writing and the reading of American history never to be instructed in anything beyond military affairs and constitutional endeavors, and so to lose sight of the fact that Americans of the time contributed to progress in technological and scientific ways as well as in the political and social innovations which were the chief result of their efforts. Franklin's work — America's principal scientific achievement of the century — is well known, and Professor Wolf tells its story lucidly. The encouragement given to technology during the century, and the closer understanding between scientists and primarily technological workers, were not, however, restricted to the Old World, as one might conclude from lack of reference to them in this account. And there are other omissions.

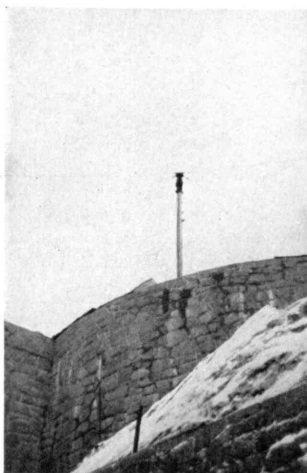
To take up the cudgels for Alexander Wilson and John Bartram as deserving mention among the naturalizing worthies of the Age of Reason is hardly necessary. Let it be admitted that their contributions to ornithology and to botany were but slight; even so, they were functioning scientists in the century. Professor Wolf tells interestingly about Jethro Tull's invention of the horse drill; it would probably be equally interesting to know something of Jared Eliot's improvement thereon. It is doubtless important that a bridge in England was built from sections cast for shipment to the United States at the order of Tom Payne (*sic*). But when this report is presented in a history whose

chapter on 18th Century social science has nothing to say of Thomas Paine's "The Rights of Man," the reader may rightfully pause to inquire if not to exclaim. One can forgive omission of references to Thomas Jefferson's ingenious calculations of plowshares but finds it difficult to pass over omission of his activities in behalf of education and to ignore the fact that one of the most important inventions of the entire century — Eli Whitney's cotton gin — finds no mention.

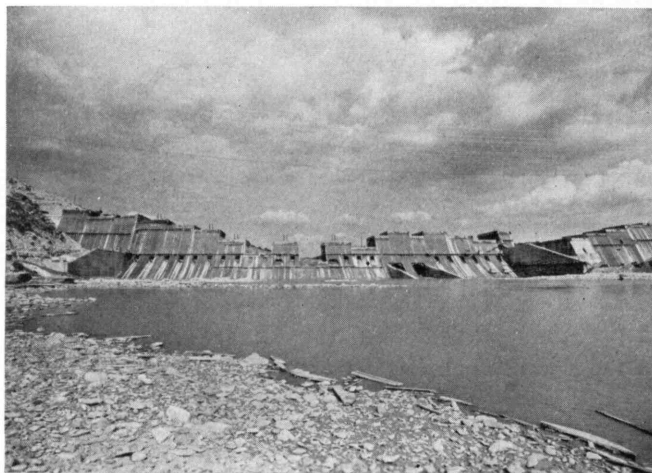
Yet it would be absurd to condemn such a book as this on the basis of omissions; Professor Wolf's study is of profound value not only to those interested in the history of science as such but also to those who find the 18th Century a center of stimulation and in many ways a refreshing contrast — in its humanitarian impulses — to our own. The omissions do, however, offer implicit commentary upon American historical writing. Allen Nevins lately has bewailed the lack of distinguished work in this field in 1938, asking for more volumes of outstanding skill. The gaps in Wolf's history seem to ask for more volumes of the kind of specialized study upon which Professor Nevins appears to look askance as a source of pedantry. Beyond this, the omissions afford direct justification for the kind of work which Carl Bridenbaugh has so admirably done in his "Cities in the Wilderness." *

Surveying the first century of the history of five representative American cities, Dr. Bridenbaugh has undertaken the exploration of a field of profound importance not only to history in general but to the history of science and technology in particular. Someone someday will coin the terms necessary to describe the culture, the civilization, and the city which received the main impetus for their growth from a technological, industrial, mechanical economy as distinguished from the agricultural, trading, and often slaveholding economy of an older time. Professor Bridenbaugh's discussion of Boston, Newport, New York, Philadelphia, and Charles Town ends, for the present, at 1742. Even so, problems peculiar to a technical civilization already are to be encountered in it.

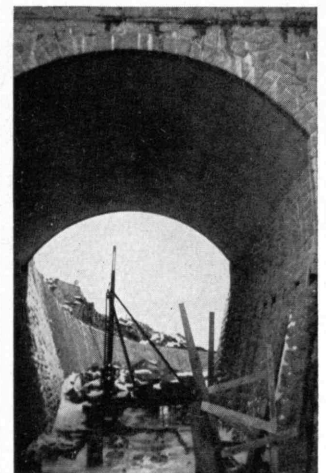
* New York: Ronald Press, 1938. xiv, 500 pages, \$5.00.



P. A. Fichtner



U. S. Bureau of Reclamation



C. L. Fassett

Watchtower, moated rampart, and sally port — medieval military architecture as recalled in the Marshall Ford Dam (center) on the Colorado River of Texas, completion of which is expected by fall, and in portions of the Barkhamstead Dam project for the water supply of Hartford, Conn.

As he goes on with the story, he will perforce deal more and more with the complex of social forces which is both cause and result of technological development. Cities in the modern sense are the outgrowth of inventions, factories, transportation systems, and similar technological consequences. At the same time, cities create demands for new technological advances and, in no small sense, provide the intellectual impetus which will produce them. Professor Bridenbaugh observes of the American cities which he discusses that in the first century of American life "most of the intellectual activity, in science, literature and the arts, and what intellectual progress there was, took place in the towns. Only there were there material and opportunity for such activity." Between this statement and Professor Wolf's analysis of the greater fostering of technology during the 18th Century there is strong relationship. Greater dissemination of the less known aspects of American history through thoroughgoing treatment of such subjects as this which Professor Bridenbaugh has made his own should be forthcoming.

Oil for Today's One-Hoss Shays

EVERY time a 60-horsepower V-8 engine turns over, its pistons sweep past metal surfaces which equal in area a full-sized newspaper page. One hundred and thirty times a second, millions of times a day, that action is repeated; and the only reason an automobile can be driven the length of a city block without failure is that contact between the metal surfaces is prevented (except for brief intervals) by a saving film of lubricant. On that microscopically thin layer — be it oil, water, or gas — which must cover every sliding surface in every mechanism rides the life of the machine.

If such a film could be created before a machine was started and could be maintained intact thereafter, no wear would take place and the machine could conceivably last forever, or at least as long as the Deacon's one-hoss shay. Yet while this age of change has little use for apparatus that will last one hundred years and a day, even a small percentage reduction in wear or lubrication failures can bring such huge savings that estimates become statistical nonsense.

The mechanical millennium when losses from such causes will be a minor factor in engineering calculations seems a step nearer because of advances in lubricating technology that have occurred since about 1920. Were it not that promiscuous usage has dulled the edge of its



E. A. Freeman

Seven or eight miles below Eustis, Maine, the Dead River cuts through surface sands to expose beds of varve clays, deposited layer by layer by the melting of a vast sheet of ice which, some 50,000 years ago, filled the mountain-locked basin through which the river now flows. The ice sheet melted in place, forming what geologists call Glacial Lake Bigelow. Erection of a storage dam in the region, as is proposed, would practically restore this early postglacial lake

meaning, the word revolution would be in order here, for few improvements in practice are more significant, few changes in concept more complete.

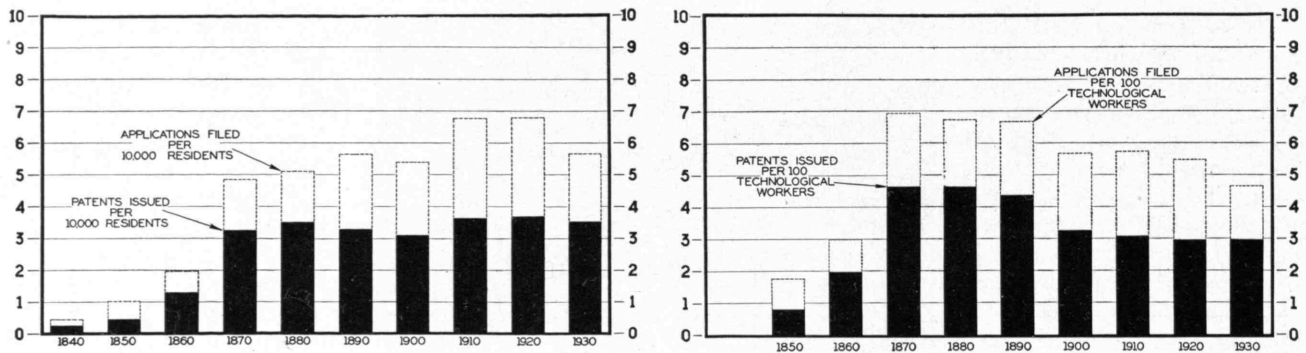
Although every other American knows what a freight-car hotbox is, and nearly everyone what a set of burnt-out crankshaft bearings means, the most common type of bearing surface — a shaft turning in its journal — is not a particularly severe lubricating problem. Such a system acts as its own pump, forcing the lubricating medium to the point of greatest load. Unusual properties are required in the oil only when speeds are very low, pressure intensities are very high, or lubrication is inadequate.

In gear teeth and on sliding surfaces (excepting shafts) there is no inherent tendency to form a film. For such usages have been created the "extreme-pressure" lubricants used in automotive rear

ends of the hypoid type, where such lubricants are vital, and even in older types, where they allow heavier loads or longer life with no other change. Because the luxury-loving public objects to a drive-shaft tunnel across the floor of the car, automobile builders have adopted the hypoid gear, which permits the center line of the drive shaft to be dropped below the center line of the rear axle.

Widely used for only three or four years, the hypoid gear has been a testing-ground headache for 15. While designed pressure intensities between gear teeth are no higher than those in spur or bevel gears, hypoid teeth tend to slide upon each other somewhat more than do other types, and are far more sensitive to the misalignment which inevitably occurs on assembly. The latter condition can build up pressures at the lines of contact which squeeze out any ordinary oils and actually weld the surfaces of the teeth together. On parting, the teeth are pitted and scuffed, as gear designers monotonously have found, year after year. If, however, certain sulphur, chlorine, and lead soap compounds (among scores of others) are added to an otherwise ordinary mineral lubricant, the oil film will cling to the teeth in spite of pressures that sometimes exceed 400,000 pounds per square inch.

The present conception of what happens (and it is one which has profoundly affected modern thought on lubrication) is that the extreme-pressure additives are made up of molecules one end of which has a very strong attraction for the metal surface. The molecules stand up more or less like eelgrass on a mud flat (to use a simile provided by Professor W. K. Lewis, '05), and although they will bend when a heavy load is slid over



Inventiveness per capita in the United States, as measured against the entire population (left) and against technological workers (right), is not increasing. Commissioner of Patents Conway P. Coe presented these charts, prepared by the Patent Office, at hearings before the Temporary National Economic Committee early this year. Technological workers as contemplated here include professional inventors, engineers, electricians, designers, draftsmen, surveyors, chemists, metallurgists, and all workers engaged in mechanical pursuits

them, they will strongly resist being torn up. Even if the load is great enough to uproot them, they will take with them only a single atomic layer of metal, and a new skin of surface-active molecules immediately forms. The mineral oil can, therefore, be described as a fluid without harmful properties which serves as a carrier for small amounts of natural or synthetic substances which actually do the lubricating. Oils so bolstered are at present being used mostly in automotive rear ends, in airplane engines, and for the cutting of metals, but as engineers become more widely aware of the potentialities of these lubricants, their applications should grow hugely in spite of their greater corrosiveness.

A convenient point from which to mark the progress in this field is the patent issued late in 1919 to Wells and Southcombe which pointed out that for many purposes animal and vegetable oils (with their contained fatty acids) were better lubricants than the more widely available petroleum fractions, and which proposed the addition of fatty acids to mineral oils. More important than the widespread use of lubricants based on this patent is the fact that investigators were led to study the effects of other additives. Via a veritable barrage of patents there have come into existence substances for raising the film-rupture strength of lubricants (the extreme-pressure oils already mentioned); for making oils flow easily in cold weather, not too easily in hot — that is, with high viscosity indexes; and for decreasing sludge-forming tendencies.

Paradoxically, the development of more thorough refining methods has intensified the need for the last type of additive. The various solvent extraction processes lately introduced on a commercial scale don't show much discrimination. Along with the harmful waxes and other impurities they also remove natural oxidation inhibitors that decrease sludging and probably cut out other valuable aids to lubrication, a point proved by the rapid sludging and poor lubricating qualities of very highly refined oils. Any natural tendency of the oil to sludge is increased by the high temperatures found on piston and cylinder walls. Otherwise, because of the relatively light unit loadings that cylinder walls must bear, they would not offer a difficult lubricating problem.

Some of today's oils, therefore, and most of tomorrow's will be alloys carrying five or six man-made chemicals on a petroleum base. To the man in the auto-

mobile all this merely means longer stretches between oil changes, fewer losses from bearing seizures. To the designer it means fewer restrictions on his ideas, greater choice of materials, lower costs. But the point about which any discussion of lubrication must finally swing is the long-continued trend found in all fields of industry toward higher speeds, heavier bearing loads, more severe operating conditions, lower factors of safety. Lubricants must be better if engineers are not to be stymied.

Patents under Pressure

AGITATION for modification or reform of the patent system in this country is more in evidence at the present time than it has been for many years. Much of this agitation has been prompted by the President's message to Congress on January 3, 1938, urging action to remedy weaknesses and abuses alleged to be present in the system. The action taken as a result of this message falls largely into two categories: introduction in Congress of a number of bills relating to patents, and establishment of the Temporary National Economic Committee. Among the broad powers granted to the T.N.E.C. is that involving investigation of the effect of patent policies upon competition, price levels, unemployment, profits, and consumption. Many hearings have been held, both with respect to the proposed bills in Congress and before the T.N.E.C., and the opinions of many qualified experts have been presented at these hearings.

The effect of extensive changes in the patent system is of vital concern to industry, but until recently there has been little organized effort by industry to study proposed changes or to participate effectively in discussing such changes as they are brought up before Congress. Recently, however, the National Association of Manufacturers has taken an active interest in this direction and is not only closely following such proposed legislation but is educating and informing industrialists through regional meetings and other activities — for example, the joint meeting (in Boston on February 15) with the Associated Industries of Massachusetts, where patents and the patent system were discussed at length, with particular reference to the activities of the Temporary National Economic Committee and proposals for modification and improvement (*Continued on page 322*)

Relations and Reason

How Mathematical Logic Throws Switches for Institute Engineers, Outlines Clauses for Actuaries, and Provides Amusement for the Puzzle-minded

BY W. V. QUINE

CAN a man be his own uncle? half uncle? Can two men be each other's uncles? half uncles? If we construe "can" in the sense of physical possibility, we have four problems here; if we construe it in the sense of legal possibility, we have four more. These eight problems are simple, and with a certain amount of fumbling we can solve them. We can satisfy ourselves that two of the four relationships suggested are physically impossible, one is possible physically but not legally, and one is possible both physically and legally.

But these problems stand in marked contrast to the little algebraic exercises which treat of men rowing upstream and downstream. In the uncle questions there is nothing to call x , no quantity to solve for; we are dependent on unimplemented thought. The difference between the two kinds of problems is not, however, a difference between the nonmathematical and the mathematical; the answers to the uncle problems are connected with the familiar principles of parentage and legal matrimony in a way which is just as mathematical, just as inexorably deductive, as the connection between the value of x and the data about current and rowing time. The difference is one, rather, between sections of mathematics — the section which treats of relations and the section which treats of numbers.

It is in the second of these sections that the science of mathematics happens to have developed most brilliantly — in arithmetic and the derivative disciplines. Even in geometry, which has no primary concern with number, the greatest advances of technique have been made by tapping the well-developed resources of numerical theory through the medium of analytical geometry. Where number is irrelevant, regimented technique is commonly lacking; our approach to the uncle problems is likely to be about as unmethodical as our

THE THREE JOINERS OF BEREA AND WHAT THEY DID — SUB- TLETY THAT BECOMES SIMPLIC- ITY AS SYMBOLS ARE PUT TO WORK — MATHEMATICS AND LOGIC COÖPERATE TO DEVISE NEW METHODS WITH VARIED TECHNOLOGICAL VALUES

approach to the rowboat problems would be if we had never studied algebra or arithmetic.

Thus it is that the progress of natural science has always depended so largely upon the discernment of measurable quantity of one sort or another. Measurement in physics or any other science consists in correlating our subject matter with the series of real numbers. Such correlations are desirable because, once

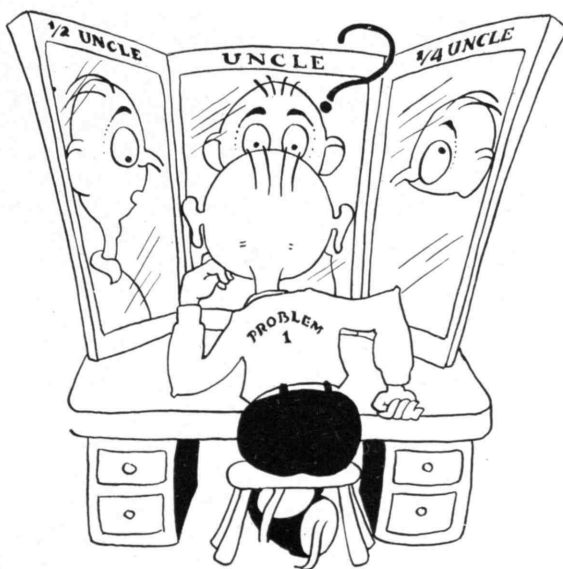
they are set up, all the well-worked theory of numerical mathematics lies ready at hand as a tool for our further reasoning.

But no science can rest entirely on measurement, and many scientific investigations are quite out of reach of that device. For those scientific problems to which measurement is not germane, techniques provided by the numerical parts of mathematics are useless. Either we must turn to those less known and less developed parts of mathematics which treat of nonnumerical matters — relations, for instance — or else we must simply forego mathematical technique and proceed by unaided common sense, as in the uncle problems.

Among the nonnumerical bits of mathematical theory which have proved useful to natural science, perhaps the best known is the theory of groups. Where a set of movements or other operations is under consideration,

the theory of groups provides a systematic technique for dealing with the effects of applying these operations one after another. But nonnumerical techniques such as this have come to the scientist's aid only at too rare intervals.

It is on this score that the scientist stands to gain a good deal from the new mathematical logic. This discipline had its crude beginnings, eight decades ago, in Boole's effort to put Aristotle's logic of the syllogism in algebraic dress. The dress, as it turned out, was fitted with wings, and in the course of the next generation logic soared to heights of generality and effectiveness



undreamed of by men who knew only the pedestrian logic of tradition. The new logic is indeed a systematization of the fundamental relationships from which *all* mathematics can be derived. From the basis which it provides we can proceed into arithmetic and the derivative disciplines by a series of definitions and elementary steps of inference. Equally, starting off from the same basis and working out our definitions and inferences in other directions, we can wind up in group theory or abstract algebra or any other of the countless parts of pure mathematics, known and unknown. To the scientist longing for nonquantitative techniques, then, mathematical logic offers relief in two ways: It provides explicit techniques for manipulating the simplest ingredients of discourse; and it provides a clear and systematic basis upon which to construct further techniques appropriate to such special scientific needs as may arise from time to time.

The simplest part of mathematical logic is the calculus of statements. Just as elementary arithmetic governs the manipulation of such connectives as $+$ and \times , so the statement calculus governs the manipulation of those connectives *and*, *or*, and so on, which are used in ordinary discourse for compounding sentences. Another operator of the statement calculus is *not*, which is, for convenience, written initially, contrary to grammatical usage: "It is not raining" becomes "not it is raining."

The rules governing *and* and *or* resemble, in many respects, those which govern \times and $+$ in arithmetic. For example, if we suppose p , q , and r replaced by any statements, it is apparent that (p and q) and r is equivalent to p and (q and r); that p and q is equivalent to q and p ; and similarly for *or*. The arithmetical law of "multiplying out" has its analogue in the statement calculus: p and (q or r) is equivalent to (p and q) or (p and r). But in the statement calculus, unlike arithmetic, there is also a law of "adding out": p or (q and r) is equivalent to (p or q) and (p or r). Another convenient way in which the behavior of *and* and *or* diverges from that of \times and $+$ is this: p and p amounts simply to p , and so does p or p . For instance, replace p by a statement;

"John is a man and John is a man" amounts simply to "John is a man."

The behavior of *not* resembles that of the minus sign in arithmetic, at least to this extent:

$\text{not not } p$ is equivalent to p alone. But the arithmetical principles $(-x) \times (-y) = x \times y$ and $(-x) + (-y) = -(x+y)$ do not carry over. Instead we have

a more symmetrical pair of principles, according to which (*not* p) and (*not* q) and (*not* p) or (*not* q) are equivalent respectively to *not* (p or q) and *not* (p and q).

Another simple part of mathematical logic — the part, indeed,



which Boole himself began — is the calculus of classes. Where α and β are replaced by general terms "particle," "man," "skilled," "employed," and so on — each of which may be thought of as naming a single collection, or class, of objects — the notation $\alpha \cap \beta$ is used to denote the common part of the two classes. Thus *skilled* \cap *employed* is the class of skilled job holders. Again, $\alpha \cup \beta$ is used to denote the total

class of all those objects which fall into at least one of the classes α and β ; thus *skilled* \cup *employed* is the class which comprises all skilled persons, employed and unemployed, together with all job holders, skilled and unskilled. The notation $\bar{\alpha}$ is used to denote the class of all objects which fall outside the class α . Thus *skilled* is the class of the unskilled. Now the principles governing \cap , \cup , and $\bar{}$ closely resemble those which govern *and*, *or*, and *not* in the statement calculus. Thus $\overline{\alpha \cap \beta} = \bar{\alpha} \cup \bar{\beta}$, $\overline{\alpha \cup \beta} = \bar{\alpha} \cap \bar{\beta}$, $\alpha = \bar{\bar{\alpha}}$, $\alpha \cap \alpha = \alpha$, $\alpha \cup \alpha = \alpha$, $\alpha \cap \beta = \beta \cap \alpha$, $\alpha \cup \beta = \beta \cup \alpha$, $\alpha \cap (\beta \cup \gamma) = (\alpha \cap \beta) \cup (\alpha \cap \gamma)$, and so on. A relation which plays a prominent role is that of inclusion: α is included in β means that all members of α are members of β . This is written $\alpha \subset \beta$, which may be treated as an abbreviation of $\alpha = \alpha \cap \beta$.

A notion which is fundamental to class theory — though not explicit in Boole's class calculus — is abstraction. The notation is $\hat{x}(\dots)$, where the blank is filled by any condition containing the variable x ; the whole denotes the class whose members are just the objects satisfying the condition in question. Thus $\hat{x}(x \text{ chews its cud})$ is the class of ruminants. Similarly, supposing an object y given, $\hat{x}(x=y)$ is the class of all objects x satisfying the condition $x=y$. In other words, it is the class whose sole member is y . This class, by the way, figures prominently in mathematical logic. It is called the unit class of y , symbolically ιy . Again, $\hat{x}(x=x)$ becomes the class of all self-identical things — in other words, simply the class of everything — commonly written V .

Another part of mathematical logic, an imposing part, is the theory of relations. One sample notion of relation theory is the distributive referent $R''\alpha$. Where R is any relation and α is any class, $R''\alpha$ is the class of all objects which bear R to one or more members of α . Thus, where R is the relation of parent to child and α is the class of criminals, $R''\alpha$ is the class of parents of criminals. Note that $R''x$ becomes automatically the class of parents (two in number) of the individual x . $R''V$ becomes simply the class of parents.

Suppose α is a period of time, thought of as a class of moments, and R is the relation which a man bears to each moment in which he lives. It is readily seen, then,



"... the class whose sole member is y "

that $R''\alpha$ becomes the class of all men living at all in the period α ; $R''\alpha$ becomes the class of men living at all outside the period α ; $R''\alpha$ becomes the class of men who do not live clear through the period α ; $R''\alpha$ becomes the class of men not living through all time before and after α (hence, all men); $R''\alpha$ becomes the class of men whose lives do not touch the period α ; $R''\alpha$ becomes the class of men whose lives are confined to α ; and so on.

Of the theorems of relation theory, one elementary illustration is this: $R''(\alpha \cup \beta) = (R''\alpha) \cup (R''\beta)$. But relation theory is useful also in making clear what principles do not hold. For example, it is not in general the case that $R''(\alpha \cap \beta) = (R''\alpha) \cap (R''\beta)$. The class of benefactors of crippled violinists does not coincide with the class of all those people who are at once benefactors of cripples and benefactors of violinists.

Mathematical logic is now becoming a major field of mathematical investigation. There is already a large body of literature, and production is accelerating. But the motive of this productivity has been, so far, almost wholly theoretical rather than technological: analysis of the foundations of mathematics. One question dealt with here is the question of minimum essential notions. For example, instead of countenancing both $+$ and $-$ in arithmetic, one could get along with just $-$, for $x + y$ can be viewed as an abbreviation of $x - (x - y)$. Now the question is: How far can such reduction be carried? It has long since appeared, mainly through the work of Frege, Peano, Dedekind, Whitehead, and Russell, that all notions of pure mathematics can be reduced by definitions to the notions of mathematical logic alone. The latter can be reduced, in turn, by further definitions to a slender bundle. In fact, all we need are two: inclusion and abstraction. Every statement of mathematical logic or arithmetic or function theory or abstract algebra or any other part of pure mathematics can be translated into a statement composed only of the notations \subset and $\hat{=}$ (. . .), of inclusion and abstraction, applied over and over. Such translation is not, indeed, convenient. The theorem $1+1=2$ would run to a length of some 217 typewritten feet when thus expanded, and the binomial theorem would reach from Pole to Pole. But the fact remains that inclusion and abstraction are the only notions ultimately presupposed by mathematics.

Further motives of mathematical logic have been reduction of the principles of mathematics to a minimum of axioms and deductive rules, discovery of mechanical procedures for testing the truth and falsehood of mathematical statements, inquiry into the scope and limits of mathematical methods of proof. In this last direction, a discovery has been made which ranks among the most sensational of modern times: Gödel has shown that it is impossible to frame a set of axioms and deductive rules adequate to the whole of mathematics, or adequate even to the whole of arithmetic! There will always be certain demonstrably indemonstrable arithmetical truths.



" . . . three joiners of Berea "

Despite the fact that mathematical logicians have hitherto been moved thus by theoretical aims, there is reason to expect that the elaborate systematizations which those aims have evoked may prove no less valuable in direct application to natural science. The yield of mathematical logic in this direction may be expected to consist largely in techniques for solving problems, but largely also in a contribution of rigor and clarity — a sharpening of the concepts of science. Such sharpening of concepts should yield practical benefits of two kinds: disclosure of hitherto hidden consequences of given scientific hypotheses and obviation of subtle errors which may stand in the way of scientific progress.

Hopes of this sort can be made to appear warranted, I believe, by discussion of a few fictitious instances of concept building. Suppose that in a sociological study occasion arises to treat the relation A of close acquaintanceship. It might prove adequate for given purposes to define A by the criterion of reciprocal use of first names. Thus xAy , x bears A to y , means that x and y call each other by their first names. Now perhaps we are interested in examining one or another feature of those groups of society — cliques, we might say — whose members are bound to one another by the relation A . But we do not want to define a clique simply as any class α satisfying the condition: (i) "All members of α bear A to one another." For where a, b, c, d, e , and f all call one another by their first names, we should prefer not to regard a, b, c , and d as forming a clique; we should prefer to regard them as forming merely part of a clique to which e and f also belong. Thus we will define a clique not as any class α satisfying (i) but as any largest class of the kind. The use of the word "largest" here is a bit vague. What is meant, however, is that the class must not exclude any persons whose inclusion would still be compatible with (i).

So far, little subtlety. This much by way of concept building might reasonably be expected without benefit of mathematical logic. Our (Continued on page 324)

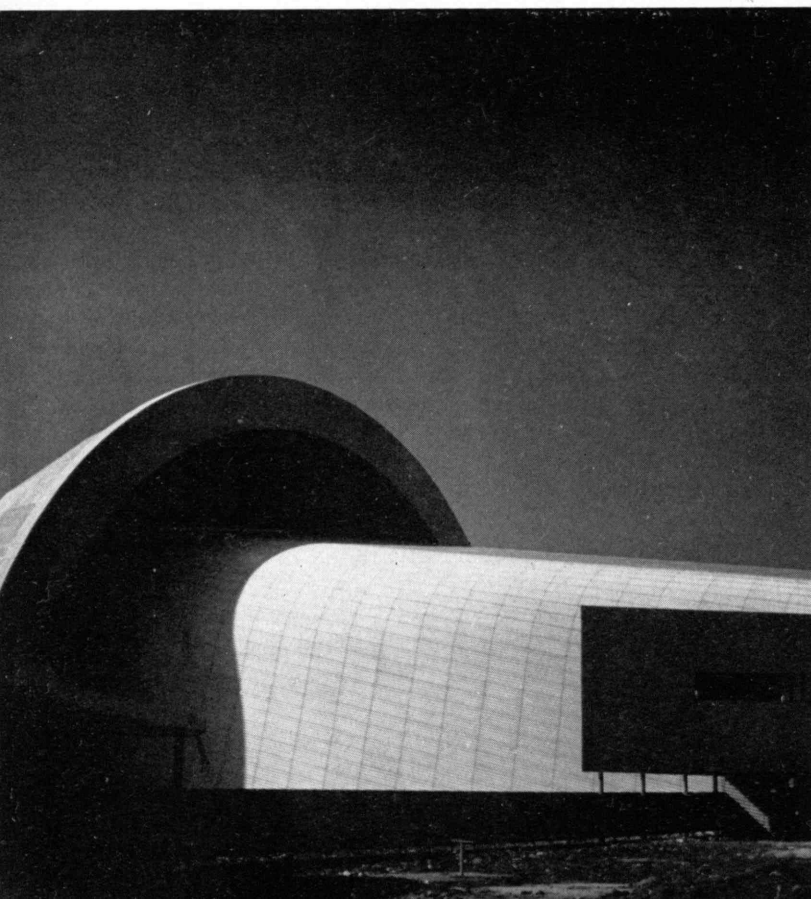


AT THE GOLDEN GATE

WHEN you arrive at the dazzling display of the new which is the New York World's Fair 1939, Alumni of the Institute will be on hand to greet you at nearly every turn. They will not be serving as official greeters vice Grover Whalen; many of them will then be nowhere near the spot. But from one end of the 1,200-acre show place to the other, they will be present in the work which they have done — work which ranges all the way from the very soil you walk upon to the topmost pinnacles of light and color which beckon you on from sight to sight.

The contributions of M.I.T. men to the Fair are of amazingly wide variety and of startling extent. In the design and construction of the myriad buildings and of the exhibits which they house, in the conception and ordering of the vast display as a whole, in the multifarious services which must be arranged and coördinated

AVIATION



Technology

Share of Institute Alumni in the Great Expo-

BY THE EDITORS

to care safely for the millions who will attend — in all these and other ways Technology men have set their mark upon the Fair. Some have done so as agents of the great city itself, some as members of the Fair's own staff of design experts, others as the executors of individual contracts, and still others as the collaborators, assistants, and staff of noted architects and designers. Naturally, however, as is enforced by the anonymity which, depending on your point of view, is one of the great strengths or one of the great weaknesses of architecture and of engineering, that mark is not to be seen by the uninitiated. The Review's function here is to initiate, and best to perform it, The Review would survey with you the Fair itself as you will see it when you arrive, say by railroad from the Pennsylvania Station.

The World's Fair station of the Long Island Railroad is the work of Michael L. Radoslovich, '26, who for two years did architectural design for the construction department of the Fair. His work, of course, was subject to the approval of the board of design of the Fair and so came under the survey of Joseph L. Hautman, '25, who as assistant to the chairman of that board was responsible for the administration of all the design elements directed by it. Since the board passed on the general plan and development of the Fair, on construction standards and types, and on all architectural designs, as well as was responsible for final inspection of all improvements constructed by the Fair Corporation, by exhibitors, and by concessionaires, Mr. Hautman has been in a key position throughout the development of the project. Likewise on the staff of the board of design since its inception during the summer of 1936 have been Nembhard N. Culin, '34, and Cornelius M. Flynn, '26, both of whom have been responsible not only for the design of embellishments on exhibit buildings built by the Fair Corporation but also for a great many structures and services provided by the corporation — information booths, special concession stands, bridges, and similar projects.

Station-platform conversation, however, cannot tell this story; rather, it is desirable to start along from the Long Island Railroad gate and swing to the right down Main Street past the Communications Building. J. Gordon Carr, '29, served as consultant architect for Donald Deskey, designer of the focal exhibit in this building. The Agfa Ansco exhibit, housed here also, was designed by Skidmore and Owings, the firm of Louis H. Skidmore, '23, who was assistant general manager in charge of design and construction of the Chicago Century of Progress. Interior architecture and lighting of the building were designed by Mr. Flynn. On the Post Office Building and the Press Building on the right

at the Fair

Design and Construction of sitions of 1939

OF THE REVIEW

of Main Street, Mr. Radoslovich assisted in design. If you turn in past the Press Building to visit the administration offices of the Fair, you encounter the work of William H. Mueser, '22, whose firm of Moran, Proctor and Freeman designed and supervised the construction of the foundations of the building. From the end of Main Street in the Street of Wheels, one passes over Grand Central Parkway on the Bridge of Wheels which, with its companion piece, the Bridge of Wings, is notable for gas-flame pylons and fluorescent tube lighting. In the design of both of these, Mr. Culin was associated.

Once across, visiting the Budd Building at the end of the Court of Railways, you find the Budd Wheel exhibit, of which Ralph T. Walker, '11, was designer through his firm of Voorhees, Walker, Foley and Smith. Walking through the Avenue of Transportation, you see in the exhibits in the Railroad Building further work of Mr. Carr, who was consultant designer with Raymond Loewy on the railroad exhibit. Thomas F. Hennessy, '37, of Loewy's staff also shared in this work. Across the way, Technology men in the Loewy organization — Mr. Hennessy, Davis Hamerstrom, '37, and Leon Hyzen, '33 — worked on the Chrysler Motors Building, which houses the transportation focal exhibit on which Mr. Carr served as consultant. The neighboring Aviation Building was designed by Mr. Carr in association with William Lescaze. Just beyond, at the end of the Court of Ships, the prows of two ocean liners are dominant in the façade of the Maritime Building which was designed by Morrison J. Broun, '30, and William E. Muschenheim, '25, in association with Ely Jacques Kahn. The sculpture and fountain in front of this building are from the designs of Sidney B. Waugh, '27. The focal and product exhibit in the neighboring Firestone Building is the work of Mr. Carr, and part of the Ford exhibit in the adjoining Ford Building was constructed by Modern Art Crafts, Inc. Associates, the organization of Nelson H. Defoe, '25. Daniel M. C. Hopping, '31, Frederick D. Petrie, '33, and Lawrence G. Cyr, '37, of Walter Teague's staff did general work on designs and drawings for the Ford project. In the development of the "City of the Future," which Norman Bel Geddes created for the General Motors exhibit next door, Frederick C. Gans, '24, worked at first on design and later as supervisor or production manager charged with the responsibility of seeing that the buildings were got onto the model on time. George N. Lykos, '35, also worked on Mr. Bel Geddes' staff.

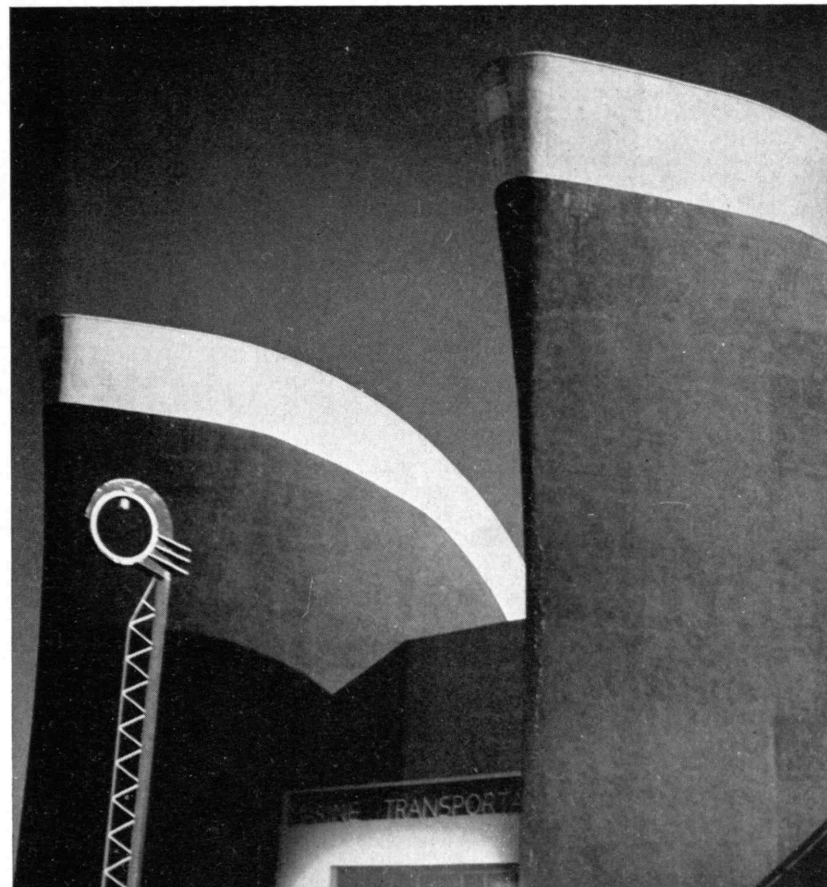
Going on from the transportation area over the Bridge of Wings, the visitor passes the Electrical Products Building, the interior presentation drawings for

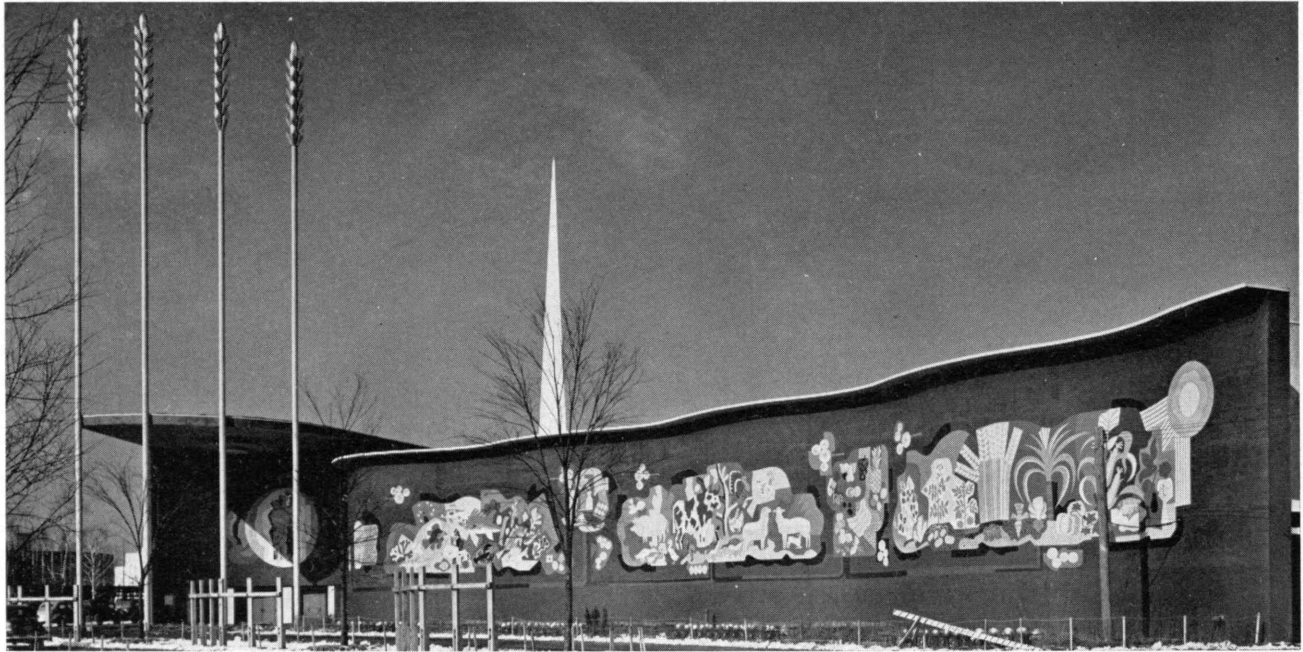


AT THE METROPOLIS

which were done by Mr. Flynn as part of his work as member of the staff of the board of design. Ahead, in the Hall of Pharmacy, Mr. Carr is again represented, as consultant architect for Donald Deskey on the pharmaceutical exhibit. The Fair's Theme exhibit toward one's left — the Trylon and Perisphere which have been so widely exhibited in miniature and sketch — is the conception of Henry Dreyfuss, to whom George L. Cory, '33, was of assistance in designing the scale model of the ideal community known as Democracy and in supervising working drawings and actual construction of this exhibit, which is inside the Perisphere itself. Mr. Defoe is also represented in the construction of one of the focal Theme exhibits. Mr. Mueser's firm designed and supervised construction of the foundation of the Theme Center. For the impressive building of the city of New York, facing the Theme Center and destined

MARINE TRANSPORTATION





Samuel H. Gottscho

THE FOOD FOCAL BUILDING

to remain on the site after the Fair is over and the region is turned into a park, designs for interior and exhibit were done by Mr. Skidmore's firm. M.I.T. men on the staff of his firm include Gordon Bunshaft, '33, and Samuel Paul, '35.

Turning back from the Perisphere through the Court of Power and the Plaza of Light, one approaches the General Electric Building, where, in Steinmetz Hall, the artificial-lightning show is staged. This building is the first to be encountered from the boards of one of the two M.I.T. firms making the largest contributions to the Fair. The G. E. Building is the work of Mr. Walker's firm of Voorhees, Walker, Foley and Smith, in association with Harrison and Foulhoux. The other chief contributing Technology firm — that of Skidmore and Owings — is represented almost next door by the Westinghouse Building, with its lofty fountain playing a synchronous symphony of color, sound, and water. Other pairs of neighbor buildings by these two firms will be seen later. Meanwhile, still in the region surrounding the Plaza of Light and Avenue of Labor, the visitor finds Walter Dorwin Teague's United States Steel Building on which the M.I.T. members of Mr. Teague's staff had various tasks to do, as they did

court of the Du Pont Building. Part of the interior of the Carrier Corporation's "igloo" next door to the Du Pont Building is the work of Mr. Carr.

Technology dominates entirely in the next pair of buildings as one goes on along the Avenue of Labor. The Petroleum Industry Building was designed by Mr. Walker's firm; the exhibits which it houses and which make use of all three of the basic techniques for this sort of work — the dramatic show, the mechanical display, and the mural — are the work of Robert Sargent Cook, '30. The building, interior, and exhibits for Swift and Company, just beyond the petroleum industry show, result in their entirety from the designs of Mr. Skidmore's firm.

Circling around Lincoln Square and crossing World's Fair Boulevard, M.I.T. people who visit the Institute's own exhibit housed in Walter Dorwin Teague's National Cash Register Building will see work in which the M.I.T. group on Mr. Teague's staff participated and more of the work of Mr. Defoe's Modern Art Crafts, Inc., which constructed the Cash Register exhibit to Teague's designs. Near by, too, is the Fair terminal of the Independent Subway, designed by Mr. Flynn. Returning to Lincoln Square from this excursion, the visitor passes another Teague building — that of the Eastman Kodak Company — preparation of which was shared by the Technology men employed by Teague.

Directly before him then is the Food Focal Building, distinguished by its murals and overhanging roof and by the four tall wheat stalks at its main entrance. Eric Kebbon, '12, who was resident architect from 1913 to 1917 for Welles Bosworth, '89, during the erection of the Institute's buildings in Cambridge, and Edward D. Stone, '27, are the Technology men who, in association with others, designed this building. The M.I.T. note thus struck is echoed often in the food area, especially in the work of Mr. Skidmore, from whose office have come designs for the Continental Baking Building and

VENEZUELA'S PAVILION — SKETCH



MAY, 1939

the Standard Brands Building with their interiors and exhibits, as well as the Coca-Cola exhibit in the Food Focal Building and the interior and exhibits for the H. J. Heinz Company in the Heinz Dome. Construction of the Heinz exhibits was done by Mr. Defoe's firm to the Skidmore and Owings designs; the Food Focal exhibit was also constructed by Mr. Defoe's firm. Mr. Walker is again represented in this area—in the Borden Building, designed by his firm of Voorhees, Walker, Foley and Smith, in which is displayed the merry-go-round dairy. Exhibits and interiors for the Owens-Illinois Glass Company, Pittsburgh Plate Glass Company, and Corning Glass Works, exhibiting in the building of Glass, Inc., were designed by Mr. Skidmore's organization. George L. Thompson, '37, worked on the Steuben glass exhibit.

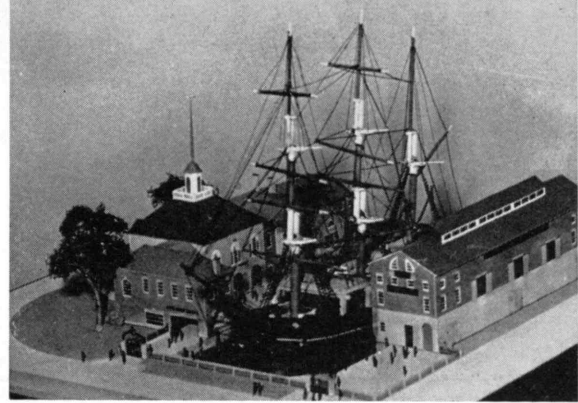
As you go back toward the Perisphere and Trylon to orient yourself, passing through Jefferson Place and the lower end of the Avenue of Pioneers, you circle the Consumers Building designed by Frederic C. Hirons, '03, in association with Peter Copeland. For this and the Metals Building, both of which were erected by the Fair Corporation, Mr. Flynn did presentation drawings for interior architecture and lighting. The Kem Kard exhibit in the Consumers Building was designed under the supervision of Mr. Hennessy. Starting up Constitution Mall on another leg of the journey about the grounds, you may visit the Fair Corporation building devoted to medicine and public health and science and education, with the curious stainless steel spiral fountain designed by Mr. Radoslovich in its court. Homer N. Calver, '14, is secretary of the advisory committee on medicine and public health, and director of health exhibits at the Fair.

Just beyond Washington Square, on the left as you stroll toward the Lagoon of Nations, stands the House of Jewels, for which Mr. Carr was architect. When you have been dazzled by the diamonds here displayed and

go on to the area where states and nations will act as your hosts, you encounter again much Technology work. The Czechoslovakian pavilion, for instance,

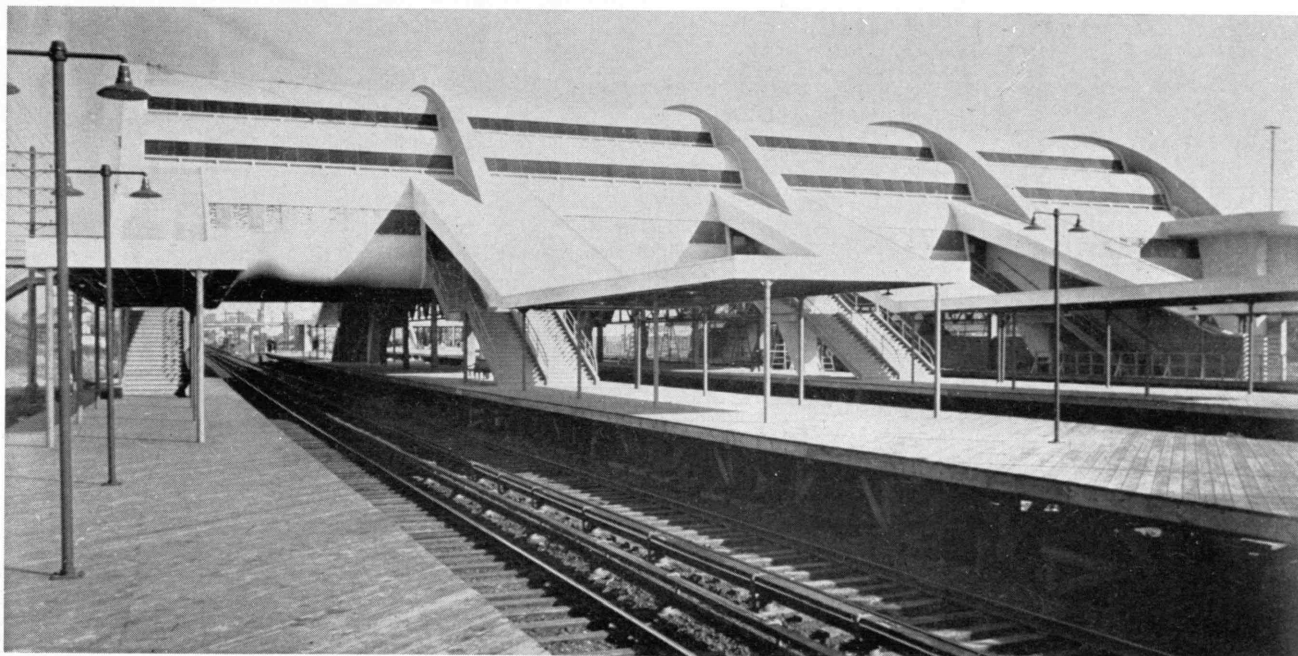
about which recent events led to so much speculation, was constructed by the Hegeman Harris Company, Inc., for whom John P. Allen, '36, and Conover Fitch, '38, have been at work. Mr. Fitch also served as assistant to the field engineer constructing the pavilion of the Union of Soviet Socialist Republics. Building, interior, and exhibits representing Venezuela are from the designs of Skidmore and Owings, and the exhibit of New Zealand from those of Mr. Stone. The New Zealand exhibit is housed in the pavilion of the government of Great Britain, with whose Fair commission James Byron Bell, '27, is an architectural designer. Construction of exhibits for Ecuador is again the work of Mr. Defoe's organization. The Teague staff's M.I.T. group—Hennessy, Hopping, Petrie, and Cyr—had tasks to perform in connection with the Federal Government Building; the aqualon fountain combining light and water, in front of the League of Nations Building, was designed by Mr. Flynn, and in the design of the Netherlands Building, Martin Rosse, '40, had a share.

New England's own exhibit—representing a New England commercial water front of the general architectural character and time of Bulfinch—was selected, from a large number of proposals, by an advisory committee of New England architects, among whom Technology was represented by Andrew H. Hepburn, '03, Robert P. Bellows, '04, Albert Harkness, '12, Wallis E. Howe, '92, and J. Lovell Little, '00. Once selection had been made, Messrs. Hepburn and Bellows



NEW ENGLAND'S EXHIBIT — MODEL

THE WORLD'S FAIR STATION OF THE LONG ISLAND RAILROAD





NO TITLE NEEDED

became members of a three-man executive committee. Hugh Perrin, '24, was authorized to develop the scheme itself and to supervise design and construction of the exhibit, acting as architectural field representative of the committee.

Crossing the Flushing River, possibly on the Tide Gate Bridge whose embellishment was designed by Mr.

Flynn, you will be interested in Tomorrow Town, which you will enter through gates which he designed. From this point you go on once again into an area where major designs by M.I.T. men are prominent. The Gas Exhibits Building, for instance, conspicuous for its four pylons of flame, is from the boards of Mr. Skidmore's firm, as is the near-by R.C.A. Building, all of which — interior and exhibits as well as the structure — was conceived by this organization. Next door to R.C.A. is the American Telephone and Telegraph Building, designed by Mr. Walker's firm. Interior of the American Radiator Building and the exhibits which it houses were designed by Skidmore and Owings. In the latter's Gas Exhibits Building, the Bryant Heater Company's exhibit was designed and supervised by Mr. Petrie for Walter Dorwin Teague. Mr. Flynn of the Fair staff is represented in presentation drawings of interior architecture and lighting for the Home Building Center and the Home Furnishings Building in this section of the grounds. And if like Omar you are to come out by the same door as in you went — that is to say, Mr. Radoslovich's Long Island Railroad Station — you will pass the Hall of Fashions on Petticoat Lane, on which Mr. Culin worked as designer for Frost and Frost, the architects. The information booths at which you have probably stopped were very likely from designs which Mr. Culin made in his capacity as a designer on the Fair's board of design staff. Decorative lighting pylons, flag poles, canopies for light and shade in the amusement area, special concession stands, flag towers, the Pan-American flag arch, and decorative lighting poles are also included in Mr. Culin's work.

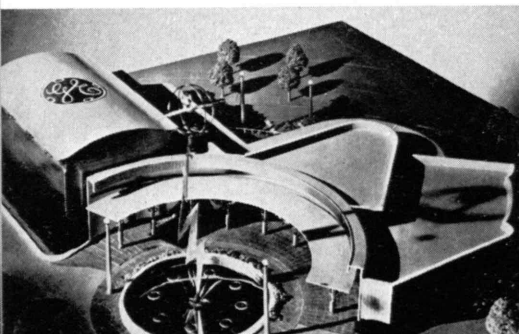
The lighting of fairs and expositions is of course one of their chief means of securing both spectacular and beautiful effects. Each fair in the past may be regarded as having contributed to the building up of theory and technique of fair lighting, but the present Fair is fortunate above those of the past because of the development of new materials and methods of lighting which were available for use. It is easy to let lights run riot, with little theme or plan, so that some contradict others in

color, some move when they should be still, and so on. The New York Fair has guarded against this possibility through the work of the committee on displays, of which Bassett Jones, '99, is chairman. Mr. Jones is also consultant on illumination. His committee worked out canons of practice long in advance of the Fair itself and designed two great displays to be seen in the Lagoon of Nations and Fountain Lake.

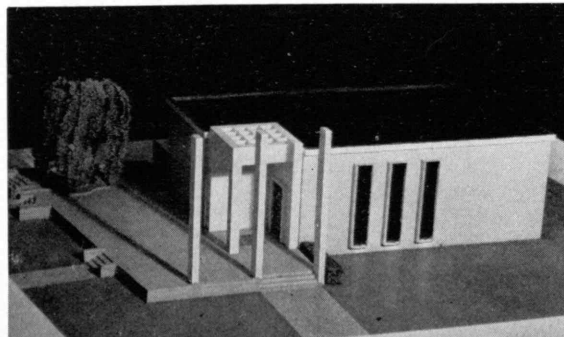
THUS far you have been naturally enough concerned with the esthetic, the informative, the recreational as the Fair brings them to you — to bring them is the justification of such activities. It is natural enough that the buildings, with their adventurous architecture, their bold use of color and sweep of design, and the exhibits, which in addition to telling an explicit story give you an implicit demonstration of designer's art and constructor's skill — it is natural enough that these should demand all your attention. Fairs are meant to do so, and fairs, in order to do so, call upon the best which the ablest architects and designers can offer. How much this Fair has had from M.I.T. men in this regard you know. There is a lot more to fairs, however, and an especially large lot more to the New York World's Fair 1939, and in all of it Technology men have likewise had a very large share. The ground on which the buildings stand, the roads and paths over which you have been walking, the water you have had to drink, the air you have been breathing — in all of these and in other ways as well Institute engineers have found work to do. The engineering history of the Fair from the Technology point of view is full as interesting and impressive as that from the architectural approach. To sketch the engineering story, The Review would ask you to begin not at the ground but below ground and work up.

Getting below ground means joining forces with William H. Mueser, '22, partner in the engineering firm of Moran, Proctor and Freeman, who were originally engaged by the park department of the city of New York to make a subsoil investigation of the Fair site. This they did, submitting a report which ultimately led to the final decision on the location of the Fair. The site itself lies almost in the geographical center as well as at the center of population of Greater New York; it was originally a marine swamp, at an elevation of only one or two feet above mean tide level. To be made into a site for the Fair and for the permanent park which will succeed it, the land had to be built up and leveled. Moreover, the problem of foundations to carry the weight of such structures as the Perisphere was no small one. Wooden piles, concrete piles, timber mats, and other means have been employed as support for various buildings at the Fair; on all foundation work for structures built, supervised, or controlled by the Fair Corporation, Mr. Mueser's firm has served as consultant. In addition, Moran, (*Continued on page 316*)

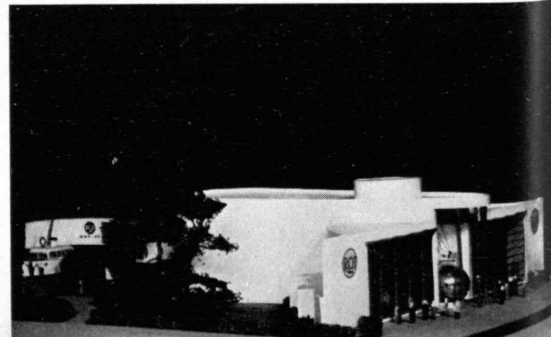
MODELS: GENERAL ELECTRIC ...



... HOUSE OF JEWELS ...



... AND R.C.A.



Blonde Demeter's Land

Australia at First Hand—Wheat in Spite of Rabbits and Droughts, Thanks to the Stump-Jump Plow

BY RICHARD HALLET

I GOT acquainted with Australia as a runaway seaman from a British bark just before the War. I knew it at first hand as a land of little rain, where water might be as precious as gold from Ballarat or Broken Hill. More precious indeed, because the dray horses at Broken Hill used to be shod with gold, locally cheaper than iron. My first glimpses of that fabled country were fugitive, necessarily, because I *was* a fugitive. In those days seamen in Sydney, like gold, like water, were precious, and if they ran away, they might be tracked with bloodhounds and brought back to their ships. My partner—Frank Hyde—and I crossed water three or four times to throw the dogs off the scent. Looking back, I question if we were worth tracking.

In the hold of our ship we had brought sheets of corrugated iron, and oil in five-gallon cans. Toiling over the baked and fissured earth of Australia's back blocks, we saw why they wanted corrugated iron. The ranchers had to catch every last drop of rain that fell. Through blue haze we caught silver flashes of the corrugated iron roofs of sheep stations, and the rounds of corrugated iron tanks which held all the water from the roofs.

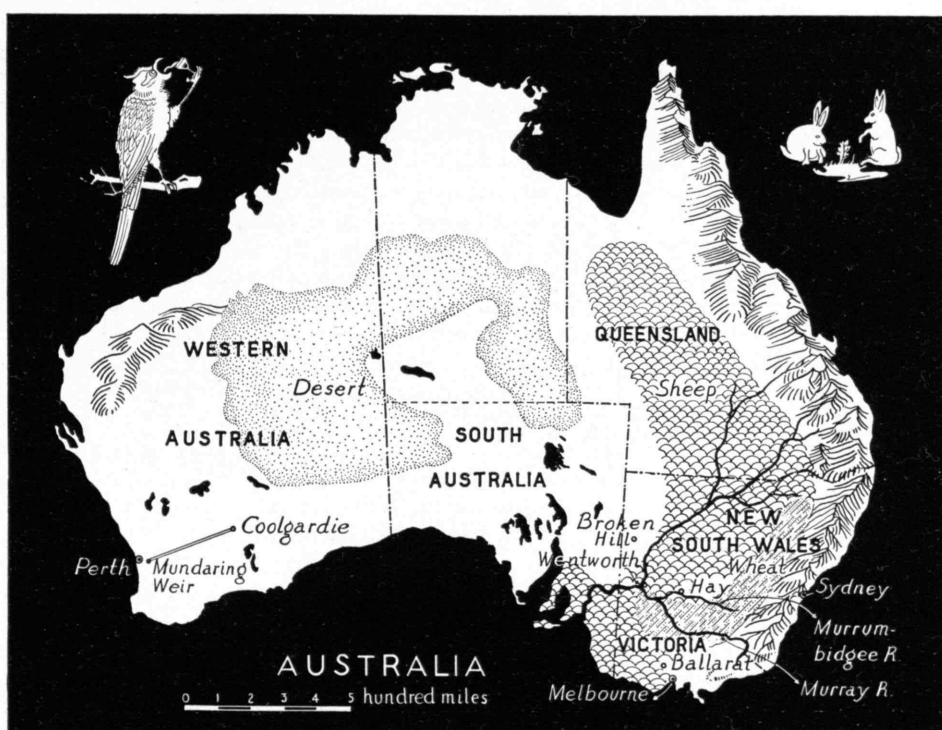
The air moving over those colossal acreages was light and dry, and most days with hardly more than a set to it. Sometimes for hours together, we traveled under

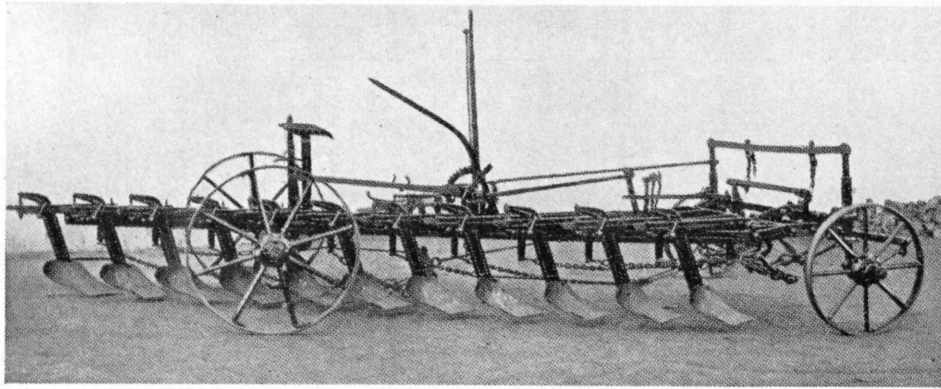
golden clouds of dust kicked up by huge flocks of sheep. With each step that we took, puffs of dust rose. Worse than dust was insect life. We slashed each other with tree branches to start up the flies which, when they lit, had a knack of screwing all their feet into the corners of our eyes. When we lay down at night, we might be struck by snakes (tiger snakes and black snakes with crimson bellies, for choice), or then again we might be stabbed by the short swords of bulldog ants. We kept our steel sharpened and scoured, so as to be able to scarify instantly in case of snake bite, and we carried for a tourniquet a bit of ship's log line which we coiled between us on the blanket before going to sleep. Snakes like the warmth of blankets and campfires, but fortunately we were never forced to scarify. And a good thing, too; scarify is a scarifying word.

I suppose that we walked about a thousand miles in all, mostly looking for work and hoping to God we wouldn't find it, and having our prayer answered. When we did work, we sheared sheep, or broke rock, or pitched wheat, or dug rabbits out of wheat fields. What surprised us even more than the lack of water were the apparent thinness of the soil and the courage of farmers who persisted in the face of what looked like insuperable odds. When our own pioneers reached the Illinois

prairies, the soil yielded better than 60 bushels of wheat to the acre. The normal yield in Australia is 10 or 11 bushels to the acre. The saving grace is that there are plenty of acres. To pasture sheep sometimes takes as high as 18 acres to a sheep; but since there is no lack of acres, there is no lack of sheep.

Yet Australian wheat-growers have known how to thrive even under adverse conditions. In 1850 there were only half a million acres under cultivation. By 1880 there were four and a half million acres and by 1910 nearly twelve million acres broken to the plow, or nearly three acres per capita of population. A good deal of this cultivation was in the East, of course—in Victoria and New South





Ziegler

This stump-jump plow drives 11 furrows. The share is carried on a pivoted arm so that abnormal pressure causes it to rise and ride over an obstruction. Weight and the pressure of the draft make it reënter the ground thereafter

Wales. Central Australia does not get 10 inches of rainfall a year and is mostly desert, but the eastern board has well over half a billion acres with more than 20 inches of rainfall a year and another half billion that gets between 10 and 20 inches. Wheat can be grown with a rainfall of 15 inches, and even, at a pinch, with 13 inches—although that takes more contriving. Wheat and oats made over 80 per cent of the Commonwealth's crop.

We were amazed by the immensity of the landholdings. As many as two thousand farmers and ranchers held between five thousand and ten thousand acres apiece. We did not go into the Northern Territory, because Sydney folk had told us, as new chums, that the woolly bushmen up there still shot poisoned arrows. But the figures there were even more impressive than for the Commonwealth at large. Slightly over two hundred leases in that Territory covered sixty million acres. Three firms had leased 26,000 square miles, more than half the area of England itself, yet for this holding they paid an annual rental of only \$13,000. An ocean of land, surely; yet to till it at a profit might seem like the effort to get gold out of the ocean at a profit. The island of Australia is not the kind of island that you carry home in your pocket and give to your son for an apple, in the language of Shakespeare's Sebastian.

The freehold of this land might be acquired under a system of conditional purchase by deferred payments. The settler must pay in half-year installments; he must reside in his holdings; and he must make certain improvements although they might be the very lightest of improvements. He must clear his land and surround it with a fence; that was about the extent of the required improvement. And if he meant to grow any crop, he must dig out all the rabbits, or they would nibble his land down as bare as the palm of your hand.

Rabbits in Australia, like the porcupine in Canada, were the poor man's friends, because he could kill them easily with stick or stone, and eat them. Toward sundown, rabbits by the thousand hopped across our path, and any tree limb, whether or no in the boomerang shape and even if you threw it with your eyes shut, was pretty certain to bring down a rabbit. This plenitude of rabbit was what made the swagman's search for work perfunctory. He might perish of thirst, but he could never starve, for he had his friends to fall back on—the rabbits, bless their hearts and livers. You cut your rabbit open and looked for white spots on the liver. If

there were no spots, the rabbit was free from hydatid and might be eaten. If there were spots, he must be let go again.

Rabbits were the poor man's friends, but they drove the wheat farmers out of their wits. Wire fencing had to be sunk to a depth of two feet around any cultivated field, to save the crop from those pests. Originally—40 years earlier—two rabbits, male and female, had been brought out from England as children's pets. Escaping and finding no enemies—nobody finds enemies in hospitable Australia—they had multiplied exceedingly and found the more abundant life. The government, alarmed, put a bounty on them. This gave them even better standing as the poor man's friends. They could be sold as well as eaten, and the government did a brisk export trade in frozen rabbits. Still they multiplied. Their progression was geometric. Once I pulled 119 rabbits out of a single hutch and, holding them by their hind legs, cracked their necks with the edge of my hand. This was the rabbit punch that years later was imported into the United States.

In desperation wheat farmers took to sprinkling German strychnine near the hutches. This was effective. It killed the rabbits, and it killed sheep and cattle, too. It killed the very birds of the air. Once, floating on the Murrumbidgee River—a tributary of the Murray—in a square-ended bateau which we had knocked together, my partner pointed out a white bird sitting on a snag in midstream. It was a sulphur-crested cockatoo, and as we came alongside, I seized it by its legs. Neither my partner nor I seemed to think that this was an unusual way to trap a bird in a land as full of surprises as Australia. I tied it to the gunwale by a piece of fishline, and we got into a tigerish argument as to what to do with it. We had eaten nothing but rabbits for so long that I was for plucking the bird and putting it into the frying pan. My partner said that if we split its tongue, it could be made to talk better than a parrot. The bird solved everything by falling down dead in the bottom of the boat. We came to our senses and saw that it had been having a meal of strychnine. The fact that it was dying had helped a little in our clever capture of it. Now we could neither teach nor eat it. But with its crest feathers tied to our hook, we caught a river cod. And so, as my partner said, there was still corn in Egypt.

Our voyage on the Murrumbidgee was in the dry season. It didn't seem as if rain had ever fallen out of that cloudless sky. The river was shrunk to a rivulet;

its yellow side walls, 30 feet high, were stuck full of the nests of bottlebirds, and at night we were deafened by the screeching of laughing jackasses overhead. Those scholarly brown birds mocked all human enterprise and seemed to say that the end of the road is only dust and ashes. Their wild bursts of insane laughter ended in exhausted titters at the folly of men foolish enough to look for rain.

Yet it had rained there, and would again. The banks were fringed with leaning gum trees whose roots hung bare, swept clean of soil by the spring freshets. When it rains, it knows how to make a job of it. Once, traveling across a naked plain, we met a man who was worrying about a distant cloud, low down, no bigger than a man's hand. We might drown in an hour, he said. We were in a great channel for storm water, a depression in the sand, imperceptible because of its vast width, which carried off the tremendous rainfall of the monsoon so fast that whole caravans of drays, sheep, men, and cattle had been swept away in front of a bore, half a mile wide, springing with little warning out of the heart of what had seemed no more than a plain covered with thin grass.

And then, too, evaporation is very great in Australia. In Central Australia, the worst desert land, evaporation is as high as 96 inches; even at Sydney it is 37 inches a year. The clouds are Indian givers: They want to have back in a hurry what they let down, and to have it back with interest. Actually, at some spots in the interior,

the year's evaporation may be greater than the rainfall. Frogs store water like camels, and the black trackers drink water out of frogs. Farmers fall back on irrigation.

Irrigation had already had a good start. At Hay and Wentworth, in New South Wales, there were twenty thousand acres under irrigation. Below us on the Murrumbidgee River was a storage dam to retain floodwaters. We heard of it, but we never came up with it because we wrecked our boat going over a bad pitch and had to leave the river. This dam wall was of masonry and concrete, 240 feet high, and the impounded waters formed a lake of twelve thousand acres. During the summer months these floodwaters were released down river to feed a network of irrigation channels.

In West Australia, the Mundaring Weir, 20 miles from Perth, was built to supply water to the famous gold fields of Coolgardie, but it resulted — as did such works of the forty-niners in California — in surprising agricultural developments. Certainly without irrigation no farming could be carried on there, since in Coolgardie no rain worth mentioning falls for six to eight months at a time. With a capacity of four and a half billion gallons, the Mundaring Weir is a concrete overflow weir, 100 feet high and 350 feet long. The water stored is carried 350 miles through a steel main 30 inches in diameter, with eight pumping stations at intervals along the main. That water came to be more valuable than Coolgardie gold, because the gold was only a fund, whereas the water was a flow. (*Continued on page 328*)



Harold M. Lambert

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE



THOMAS P. PITRÉ

M.I.T. Photo

... newly appointed associate dean of students. Assistant dean since 1930, Mr. Pitré was graduated from Amherst College in 1919, following which he became an instructor at Phillips Andover Academy. He later joined the staff of the Institute as instructor in chemistry. Mr. Pitré is the author of "Chemistry Problems" and is a member of the American Chemical Society and of Delta Upsilon Fraternity

Staff Promotions

ALUMNI as well as members of the staff are always interested in the annual Faculty appointments and promotions. This year's list includes many names familiar to recent and older graduates alike. Members of the Faculty promoted to the rank of professor are Wyman P. Fiske, Department of Business and Engineering Administration; Victor O. Homerberg, '21, Department of Metallurgy; Joseph H. Keenan, '22, Department of Mechanical Engineering; Otto C. Koppen, '24, and Joseph S. Newell, '19, Course in Aeronautical Engineering; Philip M. Morse, Manuel S. Vallarta, '21, and Bertram E. Warren, '24, all of the Department of Physics. Promoted to the grade of associate professor are Lawrence B. Anderson, '30, Herbert L. Beckwith, '26, and John L. Reid, '31, all of the School of Architecture; Francis W. Sears, '20, Department of Physics.

Those members of the staff who have been elevated to the rank of assistant professor are George A. Akin, '38, Director of the Institute's School of Chemical Engineering Practice at Buffalo, N. Y., James E. Seebold, '38, Director of the School of Chemical Engineering Practice at Parlin, N. J., and Roy P. Whitney, '35, Director of the School of Chemical Engineering Practice at Bangor, Maine. Others are Gordon S. Brown, '31, Department of Electrical Engineering; Francis M. Currier, Department of Modern Languages; Cecil G. Dunn, '30, Department of Biology and Public Health; Harold A. Freeman, '31, Department of Economics and Social Science; Albert R. Kaufmann, '38, Department of Metallurgy; Norman Levinson, '33, Department of Mathematics; M. Stanley Livingston, Department of Physics; Dwight L. Palmer, Department of Economics and Social Science; Carl M. F. Peterson, '29, Department of Mechanical Engineering and Assistant Superintendent of Buildings and Power; Irwin W. Sizer, Department of Biology and Public Health; Howard R. Staley, '35, Department of Civil and Sanitary Engineering; Henry G. Houghton, Jr., '27, Course in Aeronautical Engineering. Newly appointed as an assistant professor in metallurgy is Carl F. Floe, '35, who comes to the Institute's staff from the University of Notre Dame.

Promotions to the grade of instructor include Douglas P. Adams and Gerald Putnam, '23, both of the Section of Drawing; Richard U. Bryant, '36, Clarence W. Christiansen, Albrecht E. Reinhardt, '37, and Lucien R. Vianey, all of the Department of Mechanical Engineering; Seibert Q. Duntley, '33, Department of Physics; Albert C. Hall, '37, and Lewis P. Reitz, Jr., '37, Department of Electrical Engineering; Thomas R. P. Gibb, Jr., '38, Department of Chemistry; Francis B. Hildebrand and Eric Reissner, '38, both of the Department of Mathematics. Joseph A. Bergantz has been appointed instructor in the Department of Chemical Engineering; Albert J. Klemka, '36, and Walter H. Stockmayer, '35, instructors in the Department of Chemistry; and Ralph Eberlin of New York, lecturer in architecture.

Announcement was also made of the retirement of Professor Alpheus G. Woodman, '97, of the Department of Chemistry, who has been a member of the Institute's teaching staff for 42 years. He is a member of the American Academy of Arts and Sciences, the American Chemical Society, and is a fellow of the American Association for the Advancement of Science.

Professor Charles M. Spofford, '93, Hayward Professor of Civil Engineering, has been granted leave of absence for the first term of the next academic year.

High-Weather Studies

WEATHER conditions high over the North Atlantic from the Gulf of Mexico to the Grand Bank are being studied in an experimental international research

program organized under the direction of C.-G. A. Rossby, Head of the Institute's meteorological laboratory. This program has special significance, meteorological authorities revealed, because of plans for inauguration this summer of regular trans-Atlantic air service between North America and England.

The study is a coöperative project in which the United States Weather Bureau, United States Coast Guard vessels, the meteorological staff of M.I.T., and that of the Blue Hill Observatory of Harvard University, of which Dr. Charles F. Brooks is director, are participating. In addition, the Friez Instrument Company of Baltimore, Md., has donated 95 instruments to M.I.T. for use in studying conditions at Bermuda. Professor Rossby said that the American phase of the project grew out of a suggestion of Commander Edward H. Smith, '13, meteorologist and oceanographer of the United States Coast Guard, whose long experience at sea convinced him of the importance of the study.

One purpose of the research is to learn more about the behavior of the gigantic "cells," or eddies, of dry and moist air which hover over the Atlantic at altitudes ranging from five thousand to ten thousand feet. These mysterious air masses are suspected of breeding much of the weather over the eastern part of the North American continent, and they may have a far greater influence on conditions over the Atlantic Ocean between this continent and Europe than is now apparent.

The United States Weather Bureau and the Blue Hill Observatory are making these upper-air soundings from the meteorological laboratory of Technology in Cambridge; the Coast Guard is making the observations at Halifax Harbor and on the Grand Bank; the Bermuda soundings are in charge of members of the meteorological staff of the Institute. To provide an adequate network over the entire North Atlantic Ocean additional stations are being established by various European meteorological services on the Azores, on the Faroe Islands north of Scotland, and on Iceland.

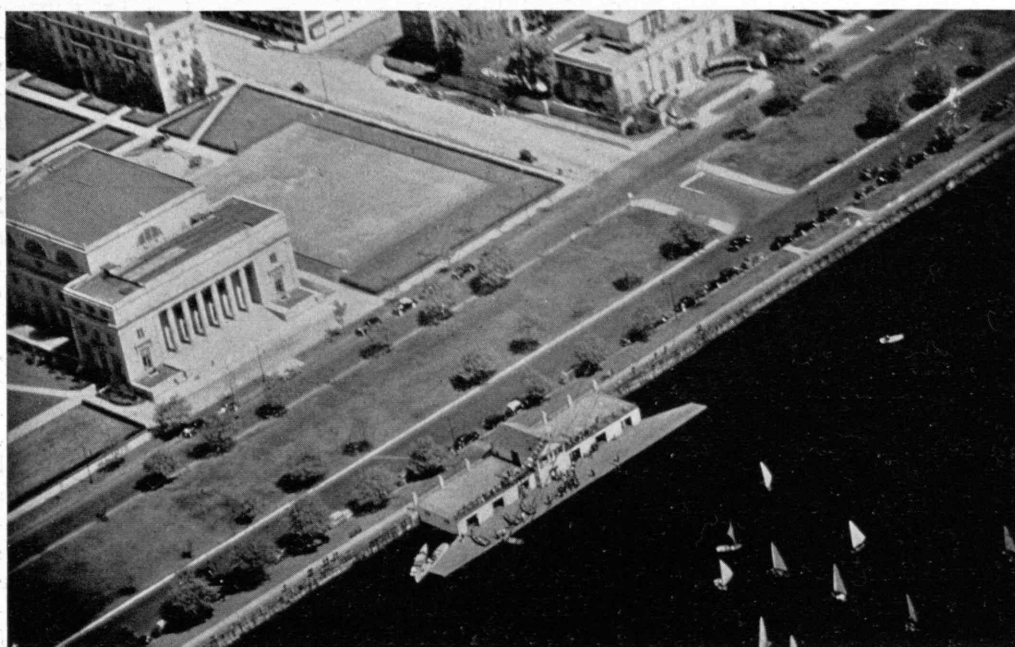
Registration at the Fair

TECHNOLOGY people who attend the New York World's Fair will want to know whether classmates and other Institute friends are in town. They may find out, and provide the answer to the same question about themselves, by registering at the new quarters of the Technology Club of New York in the Williams Club Building, 24 East 39th Street. The plan for registration at the Fair itself has been abandoned.

Data from 24 of the United States Weather Bureau's Army and Navy stations, some of which use the modern radio-equipped sounding balloons, show that during the warm season two great eddies of dry and moist air cover North America and whirl slowly in a clockwise direction, at the same time drifting slowly toward the Atlantic. These eddies are formed from two great streams, or "tongues," of moist air which come up from Mexico and the West Indies and curl around two similar tongues of dry air, one of which comes down from Canada over the Great Lakes, and the other from New England. It has been found that in the summer these moist and dry tongues move slowly, perhaps remaining nearly stationary for several weeks at a time, and are closely associated with the rainy and dry periods of weather. During the winter they travel more swiftly.

Retirement

W. SPENCER HUTCHINSON, '92, Head of the Department of Mining Engineering and internationally known mining engineer, will retire at the end of this academic year. He has been a member of the Institute's Faculty for 17 years and head of his Department since 1927. As a mining engineer in California in 1894 Professor Hutchinson obtained his first professional



SUMMER DAYS
Part of the Institute's dinghy flotilla
off the Sailing Pavilion

experience in the mining and milling of gold. In 1897 he became superintendent of the American Development and Mining Company at Gibbonsville, Idaho, and from 1900 to 1903 was employed by several Missouri zinc mines, first as superintendent and later as manager.

From 1903 to 1922 Professor Hutchinson practiced independently, and during this period his professional work took him to various continents. During one of his trips to South America he made the discovery in Peru of a new vanadium mineral, "melanovanadite." More deposits of chrome ore took Professor Hutchinson to southern Rhodesia in 1925. Peru again formed the field of his investigations in 1927 and 1928, following which he studied various mineral deposits, including iron mines, in Chile. He has also traveled extensively through Canada, Mexico, and the United States. Appointed professor of mining at Technology in 1922, Professor Hutchinson in the same year became a member of the firm of Hutchinson and Livermore.

Long an active figure in professional circles, Professor Hutchinson has been a director of the American Institute of Mining and Metallurgical Engineers and is a member of the Mining and Metallurgical Society of America. He is also a member of Tau Beta Pi and Delta Upsilon fraternities. For two terms he served as a member of the engineering division of the National Research Council. In 1915 he was awarded the Silver Medal at the San Francisco Exposition. Professor Hutchinson is the author of many papers which have appeared in various technical journals.

Class Reunions

ARRANGEMENTS for reunions formal and informal are completed or in the process of completion as surveyed below. In this first listing of reunion plans for 1939, The Review summarizes the *status quo* as far as this is currently ascertainable. In the June issue will be presented further information for those Classes whose plans have not reached the final stage in time for publication now. Formal five-year reunions are listed thus:

- 1889 — 50th reunion, Hotel Marblehead, Marblehead, Mass., June 3 and 4.
- 1894 — 45th reunion, East Bay Lodge, Osterville, Mass., June 3 and 4.
- 1899 — 40th reunion, Essex County Club, Essex, Mass., June 3, 4, and 5.
- 1904 — 35th reunion, Boxwood Manor, Old Lyme, Conn., June 23, 24, and 25.
- 1909 — 30th reunion, Oyster Harbors Club, Osterville, Mass., June 3 and 4.
- 1914 — 25th reunion, New Ocean House, Swampscott, Mass., June 3 and 4.
- 1919 — 20th reunion, time and place to be announced.
- 1924 — 15th reunion, Corinthian Yacht Club, Marblehead, Mass., June 3, 4, and 5.
- 1929 — 10th reunion, Ye Castle Inn, Saybrook, Conn., June 2, 3, and 4.
- 1934 — 5th reunion, June 3 and 4, place to be announced.

Informal reunions are planned thus by these Classes:

- 1888 — "Ninth Webster Class Dinner," 307 Hammond Street, Chestnut Hill, Mass., June 4, 7:00 P.M.

1905 — Boxwood Manor, Old Lyme, Conn., June 2, 3, and 4.

1915 — Cocktail party, Hotel Statler, Boston, June 5, 4:00 P.M. to 7:00 P.M.

1935 — Class get-together, University Club, Boston, June 5, 4:30 P.M.

A Lady and a Doctor

CONTINUING its policy of introducing to its readers outstanding Technology women, The Review presents another sketch in this series.

FOR a woman to be made an honorary life member of the American Society of Heating and Ventilating Engineers is no mean achievement. That she is also a full member of the Illuminating Engineering Society, a fellow of the American College of Surgeons, a fellow of the Royal Institute of Public Health and Hygiene, a fellow of the Royal Astronomical Society, and an Associate of Engineering Economics, to name only a few of her affiliations, deserves note. That this woman is Dr. Alice G. Bryant, '86, a quiet-spoken woman, kind and unassuming, who takes a seat in the corner until she sees work to be done, must be learned from someone else, for the doctor speaks little of herself.

Born in Boston on April 27, 1862, to Charles B. and Elizabeth W. Bryant, Alice received her early education from her parents and from private tutors, as well as at Henry Williams' Private School. Later she attended the preparatory department of Vassar College (1879 to 1881). Her A.B. degree in 1885 came from Vassar, but one year of Technology instruction went into its making. Vassar was followed by three years at the Woman's Medical College of Pennsylvania, another year at M.I.T., and a year at the Woman's Medical College, New York Infirmary, where in 1890 Dr. Bryant received her M.D. For internship she returned to Boston to the New England Hospital for Women and Children.

From here on, any attempt at chronology becomes confused, because Dr. Bryant worked so tirelessly — studying, teaching, conducting clinics, writing, inventing, and acting as consultant, the specialties which coordinated all this activity being otology and laryngology. Dr. Bryant's evening clinics in this work were the first in the country and took place at Trinity Dispensary, Boston. She was associated with the Vincent Memorial Hospital and the New England Hospital for Women and Children, also of Boston. She was also a member of the courtesy staff and later of the associate staff of the New England Deaconess Hospital. Not to become too restricted in her point of view, however, Dr. Bryant inserted terms as guest worker at Bellevue, Gouverneur, and Willard hospitals in New York City and at Pennsylvania, German, and Blockley hospitals in Philadelphia.

Her papers, published mainly in medical journals, number 75. "Streptococcic Infections of the Pharyngeal Adenoid Tissue in Adults," read before the section on laryngology and otology of the American Medical Association in 1908, was the first on this subject. To give the titles of all her papers and to name the 56 societies (five of which are British) and clubs to which she has belonged would seem like boasting and would be out of

character with Dr. Bryant. She was on the Massachusetts governing committee of the Gorgas Memorial Institute of Tropical and Preventive Medicine and in 1931 was substitute for the commissioner of education in Massachusetts for the Dalgren Prize contest sponsored by that institute. In the two succeeding years she was one of three judges in Massachusetts for the annual Gorgas Memorial essay contest. She has been on committees "to consider the present status of ventilation" (1926); for four years she was examiner for Girl Scout health-winner and health-guardian tests; for many years, consultant for the Children's Mission to Children and the Boston Children's Friend Society.

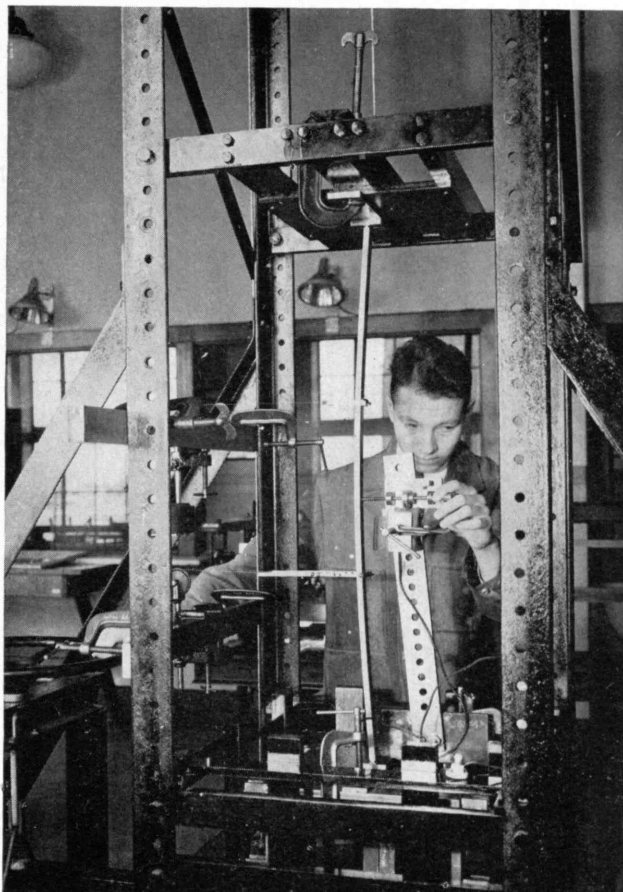
Among Dr. Bryant's inventions have been tonsil separators, a table for ear, nose, and throat work, an electric foot switch, a nasal polypus hook, a new tonsil tenaculum, tonsil snare cannula, a new tongue depressor, glass screen with adjustable standard, an ear, nose, and throat instrument box, and bone-gripping forceps.

In her religious affiliations Dr. Bryant is Unitarian, Republican as to politics. For recreation she turns to art, music, literature, and science. In 1927 three of her pictures were exhibited at the Boston Medical Library among works of art by New England physicians. Technology enjoys knowing and counting among its former students this able and versatile lady.

The Council Meets

NEITHER crystal-gazer nor prophet of profits, but observer of trends from careful study of present conditions, Treasurer Horace S. Ford presented to the Alumni Council at its 205th meeting in March an analysis of the financial situation of collegiate institutions. The population trend toward a larger proportion of persons over 50 years of age is a matter which must, he argued, concern the colleges, but from which gloomy conclusions need not necessarily be drawn. He cited as counteracting influences which have thus far insured college enrollments against any substantial loss the belief that better opportunity awaits the better educated man, the desire for higher education growing out of improvement of social and living scales, the greater possibility for education of children in smaller families, and the fact that the percentage of those in the age group from 17 to 22 years who attend college has been increasing. The privately endowed institutions, Mr. Ford held, can maintain their standing by being progressive, and this ability he felt to be especially strong for those institutions which have limited their enrollment and which possess substantial resources in personnel and in finance. A general upward trend of tuition fees is matched by an increase, which will probably continue, in the availability of scholarship aid and loan funds.

The admirably lucid presentation by the Institute's Treasurer was received with due acclaim by the Council and was accorded a hearty vote of thanks after discussion and comments. It served as apt prelude to the business of the evening, the report of the special committee on the establishment of the Alumni Fund, laid over for consideration from January. Professor C. Frank



M.I.T. Photo

Testing the buckling resistance of a pin-ended duralumin strut in the laboratory of structural analysis of the Department of Civil and Sanitary Engineering. Greater use of the lighter and more expensive alloys — consequence of the demand for lighter structures with less dead weight — is leading to more and more experimentation of this sort. Efficient use of the new materials requires even greater technical knowledge than is necessary for their less costly predecessors. Structural frames for aircraft and for lightweight trains are examples of the new kind of problems encountered by the structural engineer; to assist in meeting them is the work of the laboratory. In our picture the strut is being acted on by combined longitudinal and transverse loads, the object being to determine the critical load at which the strut will buckle

Allen, '72, set the background for this episode by sketching the history of the organization of the Alumni Association, the creation of the Association of Class Secretaries, the work of the Secretaries in the establishment of the Technology Club which flourished on Newbury Street back in 1916, and the final coming into their own of the Alumni Association and the Alumni Council under the godfatherhood of the Association of Class Secretaries. John E. Burchard, '23, then reviewed briefly features of the report by the committee on the Alumni Fund, of which he was chairman. The meeting thereupon approximated town meeting both in allusion and spirit, as considerable numbers of members joined in discussion of the operating mechanism of the new scheme, its financial aspects, the experience of other institutions in this regard, and similar matters. Unanimously thereafter it was voted to adopt the report and to proceed with further steps of putting the plan into effect.

This meeting of the Council was therefore one of considerable significance to Alumni of the Institute; it means that the necessary changes in the constitution and bylaws of the Association will in due course be brought before the Alumni for their vote. A committee on Annual Awards to Alumni was elected, consisting of Samuel C. Prescott, '94, chairman, Charles E. Smith, '00, Edward L. Moreland, '07, Marshall B. Dalton, '15, and B. Alden Thresher, '20.

At meeting No. 204, held with the M.I.T. Faculty Club in February, the New England hurricane of last September was the center of interest. Charles F. Brooks, director of the Blue Hill Observatory, in the figurative language of the Council minutes, presented "step by step the life history of the New England hurricane . . . from the time of its birth in the tropical regions of the eastern Atlantic through its brief but tempestuous career, and its final demise in the wilds of the Province of Quebec." This was not, however, New England's first tropical blow, for there is good evidence that back in 1635 the region experienced a comparable wind and since then it has suffered 23 hurricanes. Of these, perhaps three approached in violence that of 1938.

Purchased

BEXLEY HALL, a brick apartment building located on Massachusetts Avenue opposite the new Rogers Building, has been purchased by the Institute from the trustees of the Riverbank Trust. In announcing the purchase, Horace S. Ford, Treasurer, said the building will be held and operated for investment purposes.

The apartment is a four-story building containing 48 housekeeping suites, and stands directly opposite the newest addition to the Institute's educational group. Acquisition of Bexley Hall will make it possible to offer much needed living quarters to the younger members of the staff and married students. Apartments will not, however, be available to single students or groups of students for whom housing facilities are provided elsewhere on the campus. Any apartments not occupied by Technology people will be offered for public rental. The building, built 27 years ago, adjoins the Institute's land west of Massachusetts Avenue and occupies a lot of 16,488 square feet.

Visiting Committee Reports

WINTER meetings of the Corporation's Departmental Visiting Committees this year resulted in several interesting reports, two of which we condense this month.

DEPARTMENT OF CHEMISTRY *

THE major topic for discussion was the work in physical chemistry. Professor Frederick G. Keyes, Head of the Department, gave an impressive presentation of organization of the instructional program and the philosophy underlying the methods of teaching. He

* Members of this Committee for 1938-1939 are Willis F. Harrington, '05, Chairman, Godfrey L. Cabot, '81, Allen Abrams, '15, Frank W. Lovejoy, '94, Earl P. Stevenson, '19, Elmer K. Bolton, and James A. Rafferty.

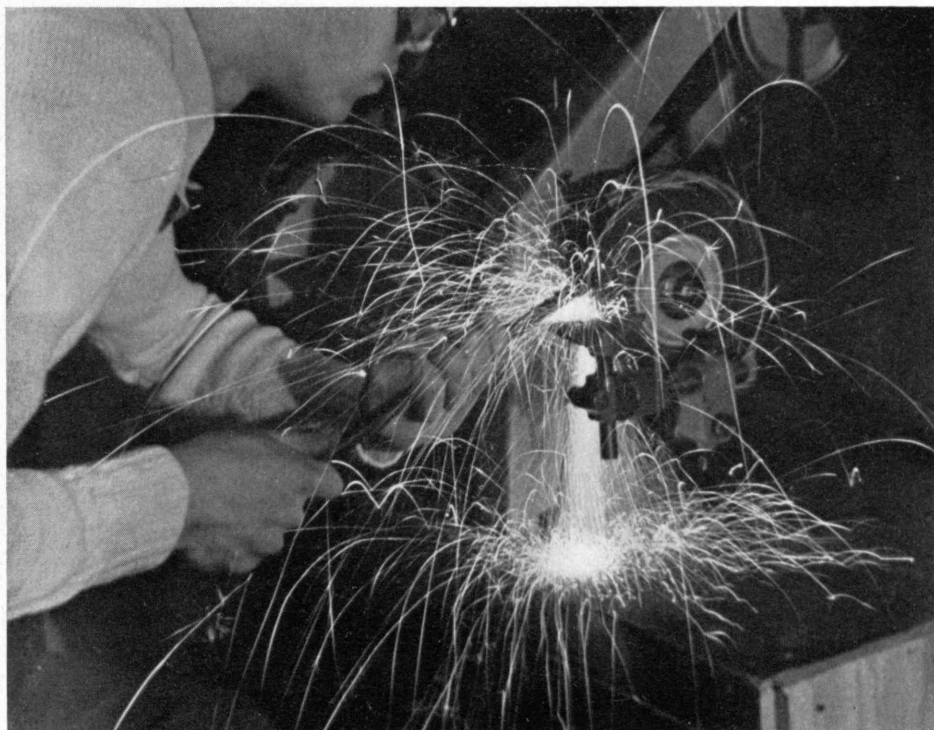
touched, moreover, upon the growth of this branch of chemistry at the Institute in recent years, the increase in the amount of material now given to the students, improvement in the quality of the students, and the readjustment of the program of instruction to advances in knowledge. It was felt that his presentation of the subject, supplemented by his associates' further elaboration of phases of the instructional work, definitely gave the Committee the impression that there had been no departure from the ideals which were set up years ago and which were so helpful in guiding the Institute to a preëminent place in this branch of chemistry.

Attention was called to the growing industrial importance of plastics and the need at the present time for chemists with knowledge of this subject. As is well appreciated, there have been significant advances in the use of plastics, resulting in their constantly widening use to replace metal and wood on account of the economy in their manufacture, greater durability, or artistic effects. It was pointed out that the chemist working in plastics has at his command a very limited number of tools for the control of his processes on account of the scant knowledge of this field of chemistry. There are very attractive possibilities for research by the physical chemist to develop methods that could be used for the control of processes and characterization of materials. The field of resinous macromolecules, of which plastics are a part, is an area of chemistry in which new knowledge is needed and which should be of particular interest to the physical chemist because physical-chemical methods will yield more information regarding these molecules than will the strictly organic method of approach. The Committee calls attention to these possibilities because it seems very likely that from such materials there will be developed a large number of new industrial uses like fibers, film, transparent sheeting, leather substitutes, coated fabrics, bristles, and so on.

The Committee was interested to learn that some attention has been given to acquainting students with patent procedure and practice. For students planning an industrial career, familiarity with this subject will undoubtedly be helpful on account of the present practice of industrial corporations to patent broadly all research developments. It has been our observation that sooner or later any man reaching a responsible position as chemist or chemical engineer will become involved with the workings of the United States patent system. The Committee generally feels that this eventuality should be recognized at some stage or another in the educational scheme, particularly at the Institute.

Another suggestion was that obsolete examples be eliminated from the teaching of fundamental principles and that use be made, as far as possible, of recent developments of industry. The Committee was interested to learn that this point of view had not been neglected and that Professor Keyes and his associates were endeavoring to make every use of up-to-date developments. To some members of the Committee this point appeared of great importance. It seemed one way to convey factual knowledge while emphasizing the fundamental, or underlying, physical principles.

IN THE
HOBBY SHOP
*The spark shower
from a grinding
wheel in the work-
room of student
craftsmen*



Martin A. Antman, '40

The Committee has no means of knowing what is the relative cost for teaching chemistry and chemical engineering as compared with other branches of science. But in view of the ever increasing importance of this branch of teaching, the Committee believes it should be the aim not to let these Courses want for a proper share of the available Institute funds. It is worthy of note that of the total student enrollment, graduate and undergraduate, at Technology, 23½ per cent are enrolled in Chemistry and Chemical Engineering, and in the Graduate School 33 per cent are registered in these two Courses.

In concluding, the Committee reiterated its conviction of the excellent quality of instruction being given the students in physical chemistry and its feeling that the Institute has not surrendered its leadership in teaching this branch of science.

DEPARTMENT OF HYGIENE *

THE Committee discussed the desirability of making vaccination for smallpox and inoculation for typhoid prerequisites to admission. Although the benefit to the students from such vaccination and inoculation was appreciated, it was deemed inadvisable to make them compulsory.

The Committee again discussed the advisability of adding a psychiatrist to the Department. In the absence of a report from the subcommittee appointed in March, 1938, to study the question, no recommendation was made.

Recommendation was voted that Professor Bunker's report be accepted and that the suggestions made

* Members of this Committee for 1938-1939 are William R. Kales, '92, Chairman, Harry J. Carlson, '92, Marshall B. Dalton, '15, Dr. Charles-Edward A. Winslow, '98, Dr. William J. Mixer, '02, J. Willard Hayden, and Dr. A. Warren Stearns.

therein for the provision of dental clinic facilities and staff should be carried out when possible. Immediately following the meeting an inspection trip was made through the Institute Infirmary. Everything was found to be in very satisfactory order.

Industrial Mathematics

LIKE many other techniques, applications of science go through a period of incubation in the ivory tower of research and then are able to get into overalls and grease jackets and bear a hand in the work of the world. Thus it is with mathematical statistics, for instance, which Institute researchers have been putting onto several interesting industrial jobs of late.

In the statisticians' kit, it appears, are tools that fit most of the important steps in the industrial process; some are applicable to the component elements to be assembled during manufacture, others to the operations of manufacturing itself, and others to the maintenance and operation of the goods after manufacture as such has been completed. Professor George P. Wadsworth of the Department of Mathematics and Harold A. Freeman of the Department of Economics and Social Science have been giving mathematical statistics plenty to do in all three of these applications, their studies including such subjects as the compounds used in sealing tin cans, the cylinder blocks employed in the compressors of refrigerating machines, and roller bearings such as are used in airplane and automobile engines.

How mathematical statistics apply early in industry is illustrated in the study of sealing compounds. The problem here is to determine the relative efficiency of sealing compounds in order to supply an answer to the question of whether the compound is to blame when a tin can fails to remain airtight. Of course a manufacturer

may place no control over his process and test all seals; by statistical methods he is enabled to evaluate production variables and sample his products sparingly, assuming that he has proper data and the right technique for using them. Many variable factors are concerned in the process for sealing cans: the temperature at which they were sealed, the temperature of the sealing machine, the type of can and of cover, the amount of fill, the atmospheric pressure, and the place of the can in the run — to mention some factors. By determining statistically the variability due to all these through the method of analysis of variance and by repeatedly redesigning the experiment, the investigators determine the ability of a given compound to retain subatmospheric pressure in spite of commercial conditions of handling. If the degree of certainty desired has been specified in advance, an answer valid to that degree can be secured by this technique.

With the cylinder blocks, the degree of quality desired is known — the block must not leak. During manufacture the blocks go through many operations, some more costly than others. Inspection at intervals results in rejections. It is impossible economically to inspect each block after each operation; hence determining the crucial spot for inspection might be expected to save money by reducing to a minimum the cost per block. If the cheaper operations are performed before this crucial inspection takes place, further economy is effected through restricting the expensive operations to those blocks which have a better chance of continuing satisfactory. The porosity of the metal used in the blocks is of importance; correlated with the percentage of components that go into the metal, it indicates which components must be accurately controlled if the enforced degree of quality is to be secured. In this study, the theory of large and small samples finds application.

Maintenance in efficient use presents a considerable problem to the operator of a fleet of trucks, for instance, who must keep up to schedules. Periodic inspection involving pulldown of motors helps him somewhat, yet is often inadequate. The roller bearings in motors may appear in good shape on inspection and may fail the day after they were checked. During inspection itself their condition is gauged only by the judgment of the inspector; empirical tests to determine their true condition would be long and costly. By studying the mortality curves of bearings as shown by inspections and records over a period of years and by making proper allowance for probable errors in the use of these curves, the statistician is able to establish a set basis for the arbitrary replacement of a certain number of bearings in a series of motors at each inspection, thus reducing to a predetermined small amount the probability of breakdown before the next inspection.

Increasing interest in these and similar applications of mathematical statistics is being shown by industrial concerns. Current requests for coöperative study are traceable in part to the conference in industrial statistics held at the Institute last September. It is expected that the two weeks' course in the subject planned for June 5 to 17, at which other practical problems will be analyzed, will disclose further uses for these techniques.

TECHNOLOGY AT THE FAIR

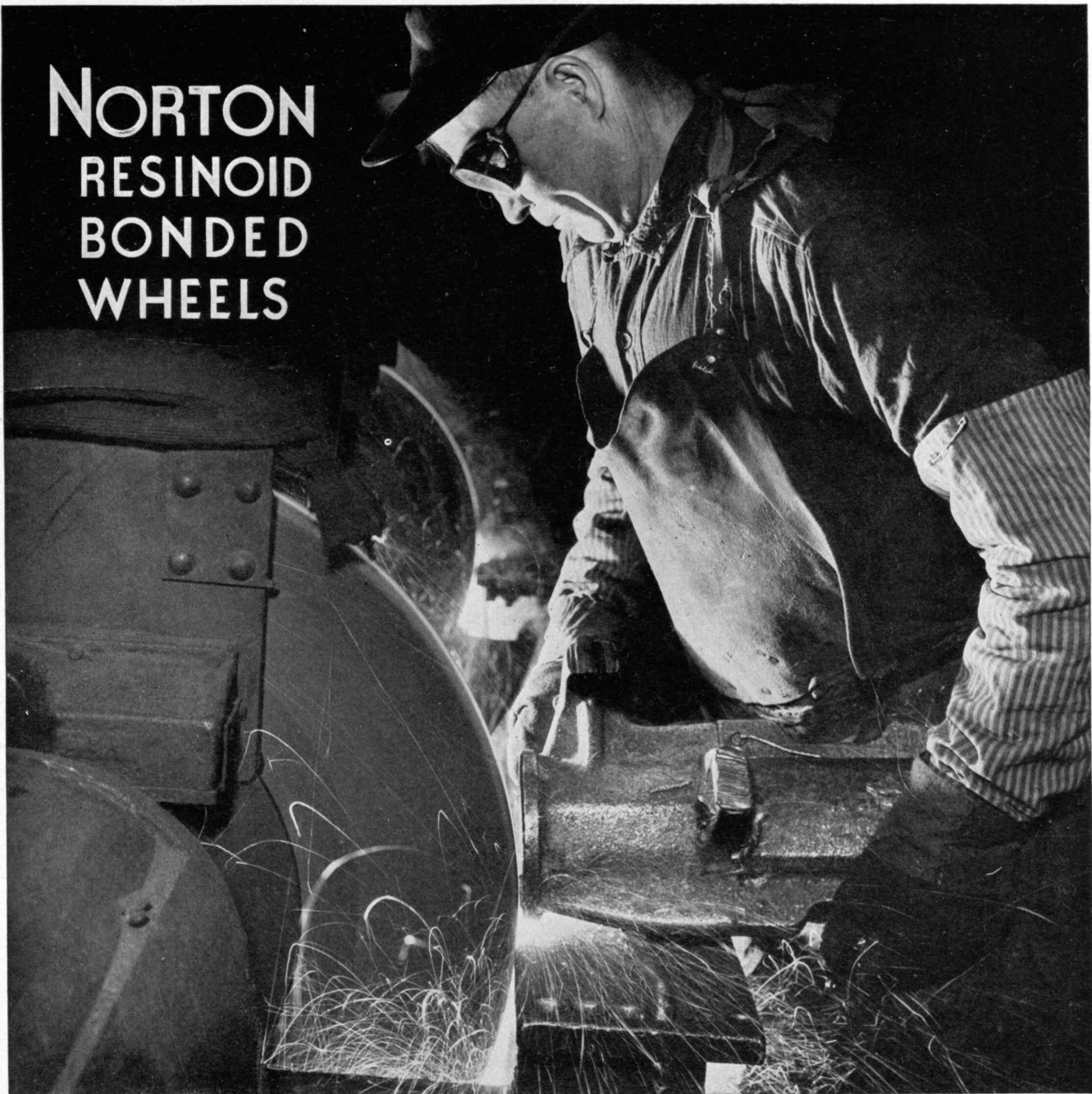
(Continued from page 306)

Proctor and Freeman designed and supervised the construction of five permanent bridges at the Fair site for the state of New York, a boat basin and tide gate for the city of New York, and, as already mentioned, the foundations for several buildings.

The topographical bureau of the borough of Queens had much work to do in connection with the Fair, laying out the area and making the surveys and maps necessary for the acquiring of title to the 1,200 acres involved. As acting engineer in charge, Albert E. Thomas, '89, was directly responsible for this work as well as for the rezoning of the Fair area and the property adjoining the parkways giving access to the Fair. A similar function for the Fair Corporation itself was carried on by Gordon W. Harvey, '24, who from October, 1936, to May, 1938, was in charge of the road squad so called, making the reference maps, or "control plans," of the Fair area. The site, comprising over 300 city blocks, constitutes a city in itself, where all streets, blocks, lot lines, and so on, have to be rigidly defined. The control plans worked out by Mr. Harvey's staff gave the basic detailed information necessary for the initiation of designs either by the Fair or by exhibitors. In addition the road squad had to design road, walk, and building grades throughout the Fair site, and prepare plans, estimates, and specifications for all roads and pavements, comprising well over a million square yards of paving of various kinds. Arthur Rogers, '22, had a share in this work, preparing road contracts under the direction of Mr. Harvey. Also serving the Fair Corporation itself for a year between January, 1937, and January, 1938, was Lester C. Hammond, '02. As assistant chief designing engineer for the Fair during 1937, he had charge of a large part of the drafting-room work and handled contractual relations of the contractors on the first 26 buildings built by the Fair, as well as landscaping of such structures as the Trylon and Perisphere.

Mr. Hammond left the Fair to become chief engineer of borough works in Manhattan, to which position he was called by Walter D. Binger, '16, who was named commissioner of borough works by Mayor LaGuardia at the end of 1937. Mr. Binger prior to that time had been first deputy commissioner of the department of sanitation, head of the engineering division which was charged with a great project for construction to improve the sanitation of the metropolis. This work had been under way a year when the Fair developed but received great impetus from the fact that the Fair was in prospect. The site of the Fair is on the Flushing River and adjacent to Flushing Bay, which had been badly polluted by sewage from the neighboring region. The sewage treatment works on Tallman's Island which had been planned to correct this condition were expedited on account of the Fair; as a result not a drop of raw sewage will enter the bay proper. The program of sewage treatment plants in which this is a factor was developed by Mr. Binger and Richard H. Gould, '11, who is acting deputy commis- *(Continued on page 318)*

NORTON RESINOID BONDED WHEELS



THE complete line of Norton Resinoid Wheels is making it possible to cut grinding costs on many jobs. Special bond formulae have been developed by the Norton laboratories for each type of work—wheels for high speed snagging and billet grinding, for cutting-off, for camshaft grinding, for roll grinding and disc wheels for surfacing. And all Norton Resinoid Wheels are made by the exclusive controlled structure process.

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NORTON ABRASIVES

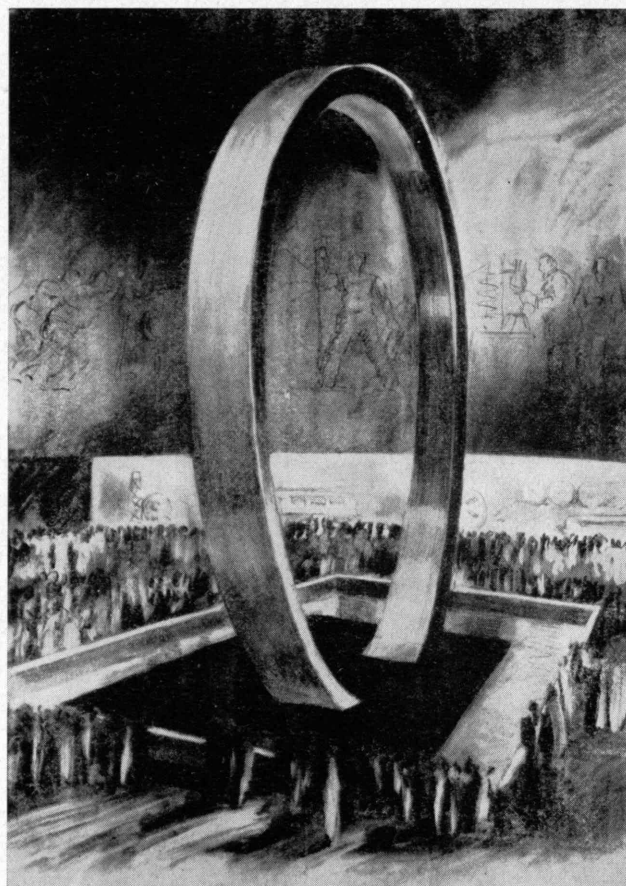
TECHNOLOGY AT THE FAIR

(Continued from page 316)

sioner of the department of public works, in charge of the entire sewage disposal program for the city. It has been argued that the Fair could not have been held on the present site had the Tallman's Island improvement not been made; it involved, of course, a system of intercepting sewers and diverting sewers as well as sewage treatment works. Maintenance work of the department is the responsibility of Charles W. Williams, '15, assistant commissioner, whose office has been active also in getting things ready to accommodate both traffic and bewildered visitors. Design problems in connection with intercepting sewers and disposal plants have been worked out under the direction of Henry Liebman, '24, designing engineer for the department of public works of the city of New York.

Demolition as well as construction received added impetus from the approach of the Fair; removal of the Sixth Avenue Elevated, for instance, which falls under the jurisdiction of Mr. Binger's department, was speeded up to meet the traffic requirements foreseen. Traffic demands likewise sped the construction of a new bridge at Meeker Avenue in the borough of Brooklyn, and a new bascule bridge over the Flushing River on the line of Northern Boulevard in the borough of Queens. With both of these projects Edward J. McGrew, Jr., '26, now deputy commissioner of the department of public works of the city of New York, was concerned during his work as deputy commissioner for bridges in the old department of plant and structures which was consolidated in the new department of public works on January 1, 1938. Allston Dana, '08, is engineer of design on the Whitestone Bridge for the Triborough Bridge Authority, which also has Maurice Grushky, '25, as assistant engineer. E. L. Pavlo, '30, A. L. Pavlo, '31, and A. S. Uman, '30, are with the firm of Madigan-Hyland, consulting engineers for the authority on much of their work.

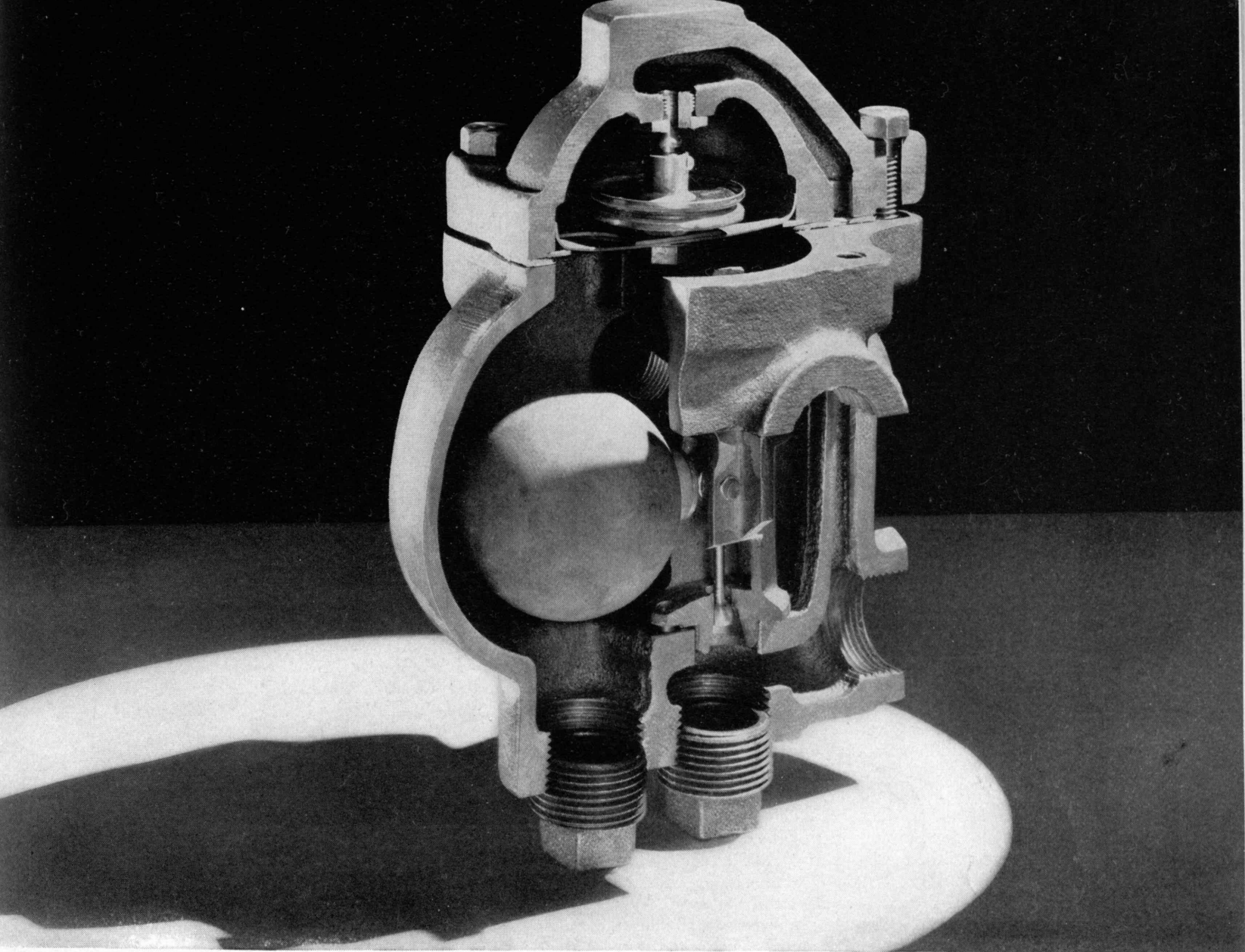
The engineering report thus far has been concerned with the land, the layout of the land, the roads and grades on the land, and the ways of getting people to the land and making sure that after they get there they will be able to breathe clean air unpolluted by sewage-fouled water. But they must have water to drink, and there must be electricity to light them — how much electricity has already been suggested in our canvass of the lighting situation. The estimated average consumption of water at the Fair is about ten million gallons a day, with a peak load of about twice that amount. Up to the borders of the Fair site the water distribution system of the department of water supply, gas and electricity of the city of New York — of which William H. Correale, '24, is deputy commissioner — was in good shape, but because of the foundations and other conditions in the site the easterly and westerly parts of the system had never been adequately tied together. A 48-inch trunk main crossing the site on a line about parallel to Horace Harding Boulevard was needed to make the adequate connection. The main had to be supported on piles for almost its whole length and was



One of the drawings of Robert Sargent Cook, '30, for PIE, the Petroleum Industry Exhibition

doubly wrapped with a special asbestos covering with a special binder because of the high corrosive qualities of the fill — the 90-foot-high mound of ashes with which Mr. Mueser's firm had had to contend. The main is about 11,000 feet in length. Within the Fair grounds the distribution system was laid by the Fair Corporation, under the supervision of the park department, with which Mr. Correale's department coöperated. Installations for air conditioning, display fountains, and other services requiring the use of water were inspected and approved by Mr. Correale's department. Electrical work in permanent structures and all permanent park lighting with its subsurface electrical construction were likewise subject to the department's approval. Abraham Brown, '24, and Myer Weisman, '21, participated in the design of the trunk mains, and the use of Johns-Manville pipe in these mains brought into the picture two other Technology men, Charles George Dandrow, '22, and William L. Keplinger, Jr., '24.

Frequent reference in this history to the park department and to the future translation of the Fair site into a permanent addition to the park system which makes the city of New York nearly unique among the great cities of the world, brings to the fore another M.I.T. man who has had to do with the Fair itself during its inception and will in all likelihood continue connection with it in time to come. He is William H. Latham, '26, park engineer of the department of parks, city of New York. During the prep- (Concluded on page 320)



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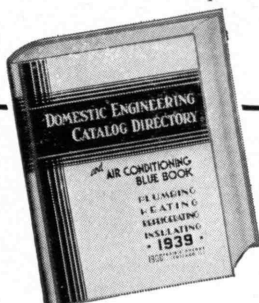
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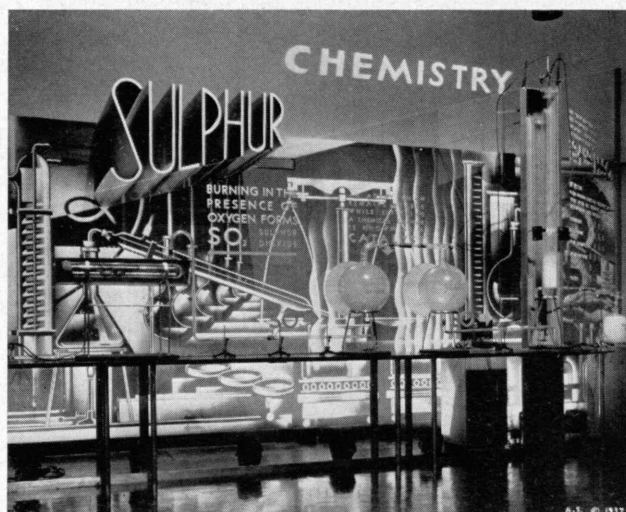
TECHNOLOGY AT THE FAIR

(Concluded from page 318)

aration of plans for the Fair and the construction of permanent improvements, Mr. Latham was in charge of all the engineering and other design work in the park department, beginning with the original topographical survey. Late in December, 1937, when planning of permanent improvements was completed and most of them were substantially finished in the field, his responsibility was changed to that of maintenance and operation. After the Fair is over, he will have responsibility for maintenance and operation of the park which will occupy the Fair site, along with his responsibility for the rest of the 20,000 acres of parks and playgrounds in the city. Mr. Latham also served as a member of the committee on basic improvements which was composed of representatives of all the state and city agencies having anything to do with developments in, near, or affected by, the Fair. Relations between the Fair Corporation and the park department on all permanent improvements constructed by the former under the terms of its lease from the city were handled by him prior to his taking over the direction of maintenance and operation.

John R. Rowe, '19, was head draftsman for Aymar Embury, 2d, on the New York City Building, engineering on which was handled by Morgan, Hamel and Engelken; A. K. Morgan of this firm is of the Class of 1925. Morgan's firm also did much light and sound engineering for the Fair, and during the operating period Mr. Morgan will be in charge of operations for the department of displays of the Theme Center, Hall of Music, and Fountain Lake. Liaison work for the Fair Corporation engaged Clinton B. F. Brill, '22, as liaison engineer. W. Olin Schirmer, '25, acted as coördinator in the purchasing department. Radio stations at the Fair site for the Municipal Broadcasting Station, WNYC, were designed under the direction of Isaac Brimberg, '24, chief engineer for WNYC. Other Technology men shared in other ways in the work of preparing for, and constructing, the Fair. Some may have escaped The Review's search; others have been named by colleagues as participants, but their particular work has not been identified. Among these latter are John B. Cabot, '34, Frank A. Faillace, '34, John A. Frank, '23, Robert J. F. Lent, '30, John W. Mihnos, '33, Willard D. Rand, Jr., '37, Benjamin L. Smith, '30, William E. Swift, '95, and John Tilley, '96.

AT the Golden Gate International Exposition on Treasure Island in San Francisco Bay, Technology's representation is literally, as well as figuratively, fundamental—the island on which the great West Coast fair is held resembles the site of the New York event in that it is to a great extent man made and to a great extent was remade through the work of M.I.T. people. Reclamation of Yerba Buena Shoals to produce an island in San Francisco Bay which might serve for the Exposition itself and thereafter be used as an airport was shared in by the San Francisco Bridge Company, of which Barrett G. Hindes, '22, is treasurer.



Sulphur into sulphuric acid as schematized in an exhibit designed by Skidmore and Owings for the Communications Building

Once the island had been built, the problem of services of all sorts had to be dealt with and was somewhat more complex than is usually so, because of the unique location of the Exposition. William E. Leland, '91, was retained by the Exposition Company as chief of the mechanical division, in charge of all mechanical work. In this capacity he saw to the planning and installation of water supply, gas supply, sanitation services, and so on. The Administration Building of the Exposition—a permanent structure which will remain in use after the island has been converted to an airport—was supplied with a heating system under his direction. The natural gas supply used for heating, cooking, and similar purposes is brought across the bay from Oakland in a submarine line under 50 to 60 pounds' pressure. Mr. Leland's division also prepared the plans and specifications for the pumping equipment and piping for the fountains which are a conspicuous part of the Exposition's display. In addition to the Lakes of the Nations, six main groups of fountains are provided. In these about 31,000 gallons of water are circulated each minute, with a total motor horsepower of about 490. The Lakes of the Nations cover about seven acres.

Among exhibits at the San Francisco Exposition those in the Federal Building are representative of the Institute: social affairs, economic affairs, the census, the Department of Justice, and similar governmental functions and agencies are summed up in exhibits designed by Kastner and Berla of Washington, D. C., of which firm Julian E. Berla, '23, is a partner. The W.P.A. recreation center and the United States housing exhibit are also the work of Mr. Berla's firm. Theodor C. Müller, '26, Technology lecturer in design in manufactured products, was active as designer and as mural painter on the exhibits done by Kastner and Berla, working out a dozen of the large exhibits and being especially concerned with the exhibit dealing with social affairs. Shepard Vogelgesang, '26, is one of the directors in charge of the exhibit of fine and decorative arts. The Pennsylvania Railroad exhibit at San Francisco's Exposition was constructed by Defoe's organization.



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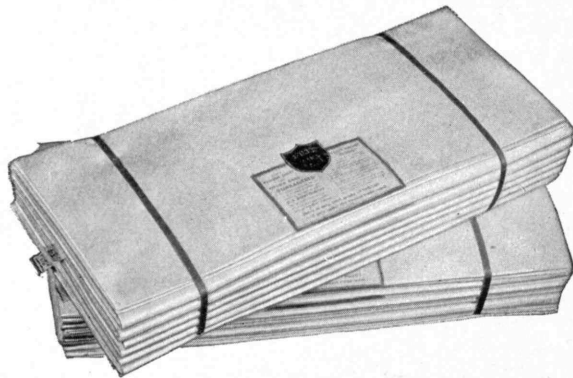
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THE TREND OF AFFAIRS

(Continued from page 298)

of the patent system. This meeting was addressed by several well-qualified individuals, including not only leading manufacturers but also the commissioner of patents, Conway P. Coe.

Any discussion of proposed changes in the patent system might well be prefaced by a statement made by Senator O'Mahoney, chairman of the T.N.E.C., following hearings at which Commissioner Coe had presented a well thought-out plan for improvements in the patent system: "The fact that patents are keystones in many very important industries has been brought home to us with great emphasis. I doubt whether I had realized their significance as a primary force in the operations of the economic system. These hearings may lead more of us to give to patents the attention they so certainly deserve."

The patent system, like any other, cannot lay claims to perfection. Possibilities of improvement can and should be studied and advanced continuously and systematically. The great difficulty hitherto has always been the failure of all parties interested — government, industry, and the public — to cooperate to the fullest extent in this study and advancement. As a result a great number of ill-conceived proposals have been advanced by persons either poorly informed or representing special interests, the effect of which proposals upon the patent system would be nothing less than disastrous.

The proposals for improvement made by Commissioner Coe before the Temporary National Economic Committee and repeated by him at the National Association of Manufacturers meeting in Boston are therefore timely and important. They go directly to the root of significant ills of the patent system, and while there may be difference of opinion with respect to some of the details, the proposals in general furnish a sound and constructive basis for future corrective legislation. These proposals include seven points: (1) There should be a single court of patent appeals. There are now ten different circuit courts to which appeal may be taken, and, as the rulings in one are not positively binding upon the others, the amount of litigation which may be required in any given instance is considerably multiplied, to say nothing of possible conflicting decisions. (2) Instead of a life of 17 years from issue, patents should be given a life of 20 years from date of filing. This should penalize long delays in the Patent Office and encourage the issuance of patents as soon as is reasonably possible after filing. (3) Interference procedure should be simplified. This procedure is now very complicated and time-consuming and should be improved, without, however, sacrificing the basic principle of granting a patent to the first inventor rather than to the individual who happens to be the first to file his application. (4) Renewal applications should be abolished. The occasion for which these were permitted, in the early days of the patent system, has largely disappeared, and they now serve chiefly as a means for merely delaying the issuing of patents. (Concluded on page 324)

ESTABLISHED 1818

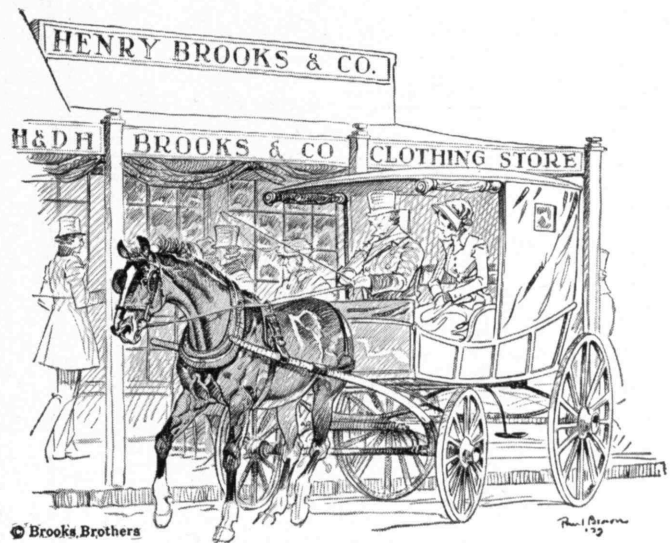
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THE TREND OF AFFAIRS

(Concluded from page 322)

(5) The present two-year period during which an inventor may publicly use an invention prior to filing a patent application should be reduced to one year. This change is in keeping with the quickened pace of industry and communication since the two-year rule went into effect many years ago, and would serve to reduce delays. (6) For similar reasons, the present two-year period allowed to an inventor, during which he may copy claims from an issued patent to assert priority, should be reduced to one year. (7) The commissioner should be given the power to require an applicant to respond to an action by the Patent Office in less than the present six months. After an application has been in prosecution for some time — say two years — the issues are usually pretty well formulated, and a response can ordinarily be prepared practically at once rather than delaying for the six months now allowed.

Contrasted with sound suggestions such as the foregoing is the current agitation in legislative and other circles against "suppressed" patents. Great concern is evidenced against such patents which are allegedly taken out on valuable improvements but are said to be allowed to lie dormant while preventing others from benefiting by their use. But so far, diligent inquiry has failed to show any instances of such patents. While it is true that some may exist, the actual fact is that most unused, or dormant, patents are not exploited because there are better alternative processes or products, or there is no market, or economic conditions have changed, or because of some equally determining reason which it would be foolhardy to disregard. A patent has only a limited life, and the urge is always to operate under it or to sell or license it in order thus to secure whatever income may be had.

Some proposed legislation, notably the McFarlane bill (H.R. 10,068) for compulsory licensing of patents, favors the large manufacturers at the expense of the medium and smaller manufacturers and the independent inventors, although it can hardly be assumed that such was the original intent. Patents provide a means whereby smaller manufacturers and independent inventors can place themselves, to a reasonable extent at least, on an equal footing with the largest groups. The protection which they afford should not be undermined by ill-advised legislation.

RELATIONS AND REASON

(Continued from page 301)

definition of clique is, perhaps, somewhat off toward the periphery of intuitive logic, but the form of construction used is an important one, capable of application in other connections as well. Suppose we were to study the relation F of college fraternity brother rather than the relation A ; i.e., let xFy mean that x and y are fraternity brothers. Then what defined the notion of a clique comes now to define the notion of a college fraternity. A fra-

ternity is any class α which satisfies the condition: (ii) "All members of α bear F to one another," and which excludes no person whose inclusion would still be compatible with (ii).

Now to the subtlety. A third application of our form of construction would appear to be the following. Take L as the relation of lodge brother and define lodge as any class α which satisfies the condition: (iii) "All members of α bear L to one another," and which excludes no persons whose inclusion would still be compatible with (iii). Actually, however, this is wrong! Suppose that Elson, Mallow, and Elbow are citizens of Berea; that Elson is an Elk and a Mason, Mallow is a Mason and an Odd Fellow, and Elbow is an Elk and an Odd Fellow; and that no other Berean belongs to more than one lodge. Now let α be the class which has these three men as members. It is clear, to begin with, that α fulfills the condition (iii); Elson and Elbow are lodge brothers (through the Elks), so are Elson and Mallow (through the Masons), and so are Mallow and Elbow (through the Odd Fellows). Furthermore, α excludes no persons whose inclusion would still be compatible with (iii), for such a person would have to be a lodge brother of Elson, Mallow, and Elbow. To this end he would have to belong to at least two of the three lodges, but we know that there is no such joiner in all Berea apart from Elson, Mallow, and Elbow. We see, therefore, that our class of three men would constitute a lodge according to the definition proposed. The definition is thus a failure, for the three men do not actually constitute a whole lodge nor, indeed, even part of a lodge.

And why isn't our definition of fraternity subject to the same difficulty? The answer is that fraternities, unlike lodges, are mutually exclusive. This precludes any situation analogous to that which obtains among the lodges of Berea. The mutual exclusiveness of fraternities can also be phrased as a property of F , namely, transitivity; i.e., if xFy and yFz , then xFz . If x and y are fraternity brothers, and y and z are, then so are x and z ; for y cannot have been linked to x and z through different fraternities.

But there is a further subtlety; mutual exclusiveness, or transitivity, is not the whole story. Consider again the relation A and the cliques. Cliques are not mutually exclusive, nor is A transitive. From the facts that x and y call each other by their first names and that y and z do so, it by no means follows that x and z do so. Despite this, however, the proposed definition of clique remains sound. Now why should the construction work for clique as well as for fraternity yet fail for lodge? We see that the crux of the problem is not transitivity, or mutual exclusiveness. What it is may be left to the mathematical logician.¹

It is perhaps needless to say that mathematical logic does not leave these definitions in such awkward form. Relation theory enables us to transform them to terms whose manipulation follows clear laws. Transformed, the definition of clique (and similarly of fraternity) is as follows: A clique is any class α such that $\alpha = \hat{x}(\alpha Cx \cup A'x)$. In words a clique is any class α whose members are all and only those objects x such that all members of α other than x bear A to x . But the symbols are easier than the words are. (Continued on page 336)

PRINCIPLES OF ELECTROCHEMISTRY

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THIS entirely new treatise, 15 years in preparation, is both a readable and an extremely painstaking account of the science of electrochemistry as it is today. Careful arrangement of the subject matter and logical development of the concepts involved make it particularly desirable for use as a textbook. The basic principles are discussed and critically evaluated; and the foundation thus laid is used as a basis for the introduction of more recent ideas, such as the extension of the Debye-Hückel theory, the application of the interionic attraction theory to electrolytic conductance, the use of the glass electrode, and the Tiselius electrophoresis technique for the study of proteins.

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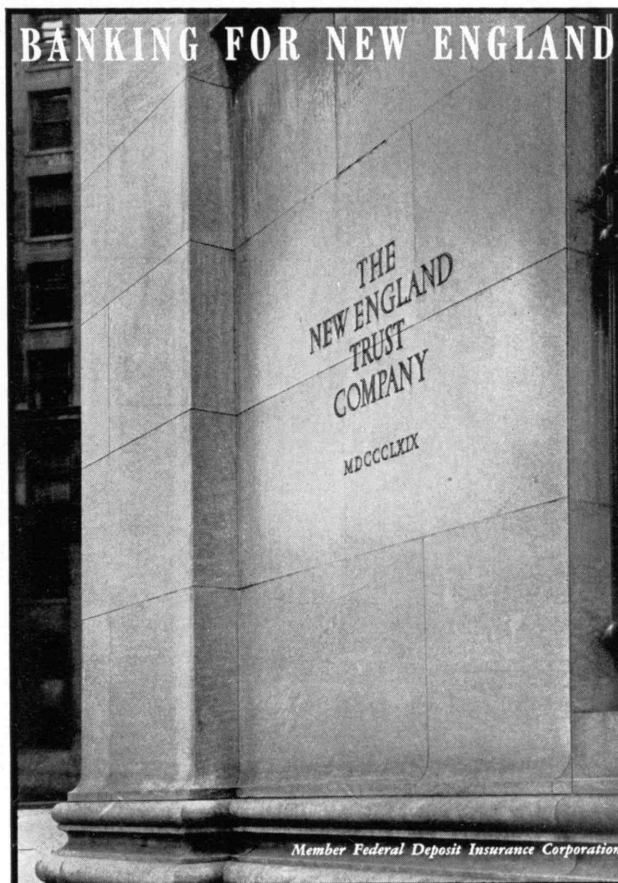
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RELATIONS AND REASON

(Continued from page 325)

By way of application of mathematical logic to the solution of specific technical problems, some striking cases have been turned up by Claude E. Shannon, a graduate student at Technology. In the statement calculus, the simplest part of mathematical logic, Shannon has found a tool for the solution of numerous problems in electrical engineering.² The efficacy of the tool can be made apparent with the help of Fig. 1, which shows a two-terminal circuit containing 14 positions for the making and breaking of contact. These positions are

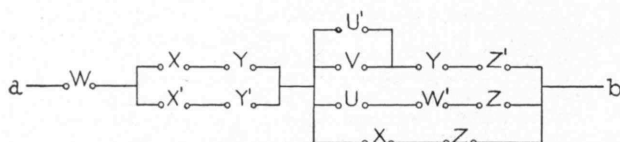


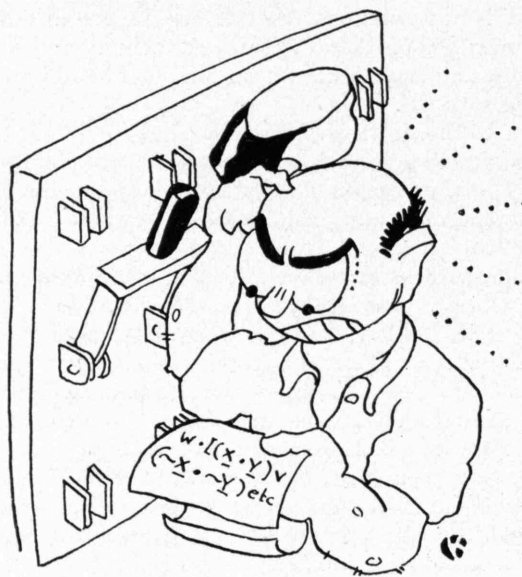
Fig. 1

connected variously in series and in parallel as depicted, and each of them may be thought of as controlled from one or another of six hand switches u, v, w, x, y , and z , not appearing in the diagram. The contact marked U is made and the one marked U' is broken when the handle of switch u is up; the two contacts marked X are made and the one marked X' is broken when the handle of switch x is up; and so on. Now there are 2^6 , or 64, possible ways of leaving our six switch handles: none up, u alone up, v alone up, u and v alone up, and so on. From among these 64 situations just certain ones will close the whole circuit from a to b .

One problem which might be proposed now is the determination of the particular switch situations which will close the circuit. A further problem, however, is this: What hookup simpler than that of Fig. 1 would yield the same result? What is the simplest hookup which would call for exactly the same switch situations to close the circuit as does the given hookup?

Now if current is to pass from a to b , clearly the contact marked W must be made. Again, either the first contact marked X and the first contact marked Y must both be made or else those marked X' and Y' must both be made, for the current must pass through one or other of these two routes. Examination of the right-hand half of Fig. 1 gives the further conditions that must be fulfilled, but let us defer these and consider the simple conditions so far derived: The W contact must be made, and either the first X contact and the first Y contact or else the X' contact and the Y' contact. This means that switch handle w must be up and x and y must both be up or both down. If we write W hereafter to mean " w is up," X to mean " x is up," and so on, our conditions can be put together thus: (iv) W and $[(X \text{ and } Y) \text{ or } (\text{not } X \text{ and } \text{not } Y)]$. Here, then, is the left segment of a statement of the total switch conditions that close the circuit.

But observe that (iv) stands in a neat correspondence to the left segment of Fig. 1 itself: *And* corresponds to series connection of contacts, *or* corresponds to parallel



Engineer throwing logical switches

connection of contacts, and *not* corresponds to the accent. Simply by following this same principle of correspondence through the rest of Fig. 1, the formulation begun in (iv) can be finished without further thought: (v) W and $[(X \text{ and } Y) \text{ or } (\text{not } X \text{ and } \text{not } Y)]$ and $\{[(\text{not } U \text{ or } V) \text{ and } Y \text{ and } \text{not } Z] \text{ or } (U \text{ and } \text{not } W \text{ and } Z) \text{ or } (X \text{ and } Z)\}$.

This tells us exactly the conditions, as regards switches, under which the circuit will be closed. Or rather, it does so if we are agile enough in reading out the piled up *and*'s, *or*'s, and *not*'s to grasp the net import of the whole complex statement — but this is a big order. However, the routine manipulations of the statement calculus enable us to transform (v) into more and more simple equivalent statements, step by step, until the net import does become obvious. Skipping the intermediate stages of these mechanical transformations, I will put down the result: (vi) W and X and Y and $(V \text{ or } Z \text{ or } \text{not } U)$. In this form the condition on the switches is clear: The circuit will be closed just in case w, x , and y are up and either u is down or else v or z is up.

In finding this out we have incidentally solved our further problem of finding the simplest hookup which would have the effect of the original. For just as (v)

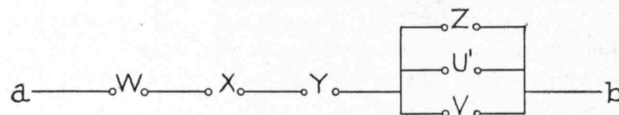


Fig. 2

was obtained from Fig. 1 by a simple rule of translation, so our reduced statement (vi) can be translated back into a diagram as Fig. 2. Here we see a hookup which uses just six contacts instead of 14, yet accomplishes the same result as the original. The machine for which the hookup of Fig. 1 was designed can now be built pretty cheaply.

Insurance is another field where an elementary level of mathematical logic has proved useful in solving practical problems. E. C. Berkeley of the Prudential Insurance Company has made extensive use of the class calculus in connection with the formulation and application of complex contracts.³ Not that the Prudential policies will be printed hereafter in logical symbols; the symbols merely make their contribution to insurance within the privacy of Mr. Berkeley's office.

Clause writing is a complicated matter. The regulations involved in the employees' pension plan of a large corporation may run to more than a dozen closely printed pages. Now suppose such a plan has finally been written out in a series of 50-odd laborious paragraphs covering all the special combinations of relevant circumstances that may arise on the part of the employees. What reason have we to believe that the whole could not have been formulated equivalently in half the space and with half the labor, simply by recombining and reclassifying the employees' circumstances along different lines? If there is such a short cut, common-sense thinking will never reveal it unless by luck, for the pension plan is too unwieldy an affair to revolve *in toto* in the mind. Mathematical logic, then, to the rescue: Berkeley schematizes his clauses in the formal notation of logic, then transforms the set of clauses systematically into the simplest possible equivalent by routine techniques of manipulation. The result goes back into English.

The usefulness of mathematical logic to insurance is not limited to the simplification of contracts. Berkeley uses it also in testing the consistency of a set of clauses; in determining the implications of a contract for one or another random set of circumstances; in distilling out the net differences between two closely related contracts; in all places, in short, where he detects value in being able to manipulate the terms of a contract with mathematical facility.

The usefulness of mathematical logic for Shannon and for Berkeley has resided in the application of pre-fabricated techniques to preformulated problems. The practical usefulness of a theory is not, however, to be appraised alone on the basis of such cases. We must allow the applicational needs themselves, rather, to play their part in motivating future elaborations of theory — just as the elaboration of tensor analysis and even of the differential calculus was motivated by the needs of physics. The history of mathematics has consisted to an important degree in such give-and-take between theory and application. Much of the value of mathematical logic for technology lies not merely in the direct applications of its already perfected techniques but in its potentialities as a basis from which to construct subsidiary techniques of unforeseen kinds in response to special needs.

FOOTNOTES

¹ The essential problem under consideration has been pointed out and investigated by H. N. Goodman, in unpublished writings.

² C. E. Shannon, *Transactions of the American Institute of Electrical Engineers*, Vol. 57, pp. 713-723 (1938). I am indebted to this for essential features of the appended example.

³ E. C. Berkeley, *The Record* (American Institute of Actuaries), Vol. 26, part 2, pp. 373-414.

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BLONDE DEMETER'S LAND

(Continued from page 309)

Paddy Rolfe, one of my none too numerous employers, told me that the banks of the Murray alone, under irrigation, would support a population of five million. I was against large populations, but I had to concede that Paddy was probably right. At least, the irrigable area in the Murray basin is estimated at fifty million acres. The whole rainfall there comes in a few months of the year. Luckily this coincides with the growing season; but horses, sheep, and stock must be watered from the artesian bores and from the pipe lines and drains that radiate from them. Victoria had 2,700 miles of such drains when I was there. Australia altogether had 3,500 artesian and subartesian bores at that time, representing a total depth of 3,750,000 feet bored and a total daily flow of three and a half billion gallons of water. A few of these bores were five thousand feet deep; plenty were from one thousand to two thousand.

Water wizards and rain makers should do well in Australia. Ringing the continent is a belt of rich alluvial soil 40 miles wide, which has plenty of rainfall. Outside this belt, however, and in some of the most considerable wheat-growing areas, drought always threatens. The question of water is always to the fore. In the drought of 1914 there was an average yield of only two bushels of wheat to the acre. Wheat hay and chaff for the stock had to be imported, and a price as high as \$75 a ton was paid for chaff alone. But Australians never yield to drought. In the year following, as if in a gesture of defiance, the national wheat acreage was increased by more than three million acres. Dust bowls of the world, take notice.

Next to rabbits and the droughts, trees were the big obstacle to growing wheat. The mallee scrub in Victoria and South Australia consisted of thickly clustered eucalyptus, 15 feet high and with swollen rootstocks. These were stubborn. The farmer wrapped chains around them and pulled them down with bullocks. On Paddy Rolfe's thousand-acre farm at Little River in New South Wales, the growth was heavier. The eucalyptus there grew sometimes to a great height and gave the landscape the look of a noble park, like the oak openings of early Illinois. "Takes two men and a boy to look to the tops of them trees," Paddy boasted.

To clear this land Paddy ringbarked his trees, cutting a ring into the trunk of the tree a few inches from the ground, so that in a few months the tree died. Even in life, since they shed their bark instead of their leaves, gum trees could look a little disheveled. When dead, they stood grotesquely, bone white, and looked much like Ezekiel's vision of the valley of dry bones. Their top weight caused them to break where the ring was cut, as neatly almost as glass breaks where the diamond

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scratches it. They fell to the ground, and Paddy burned them, but the stumps remained, just as in the mallee scrub.

Intensive farming was nothing in the life of an Australian farmer breaking new acreage. It had to be extensive, or nothing; like the country itself. A man would be a long while pulling the roots out of a thousand-acre farm. The devil of debt was at his heels. He must work fast to earn that government installment payment of twelve and a half cents an acre. Not even a Mighty Monarch stump puller could do the work fast enough for him. It was bad enough that he must fence and dig the rabbits out.

Yet something had to be done about the stumps. You couldn't be ramming plows into them with four-horse teams. And the stumps were too thick for you to try to squirm the plow around them. But Australian farmers were not going to be stymied by a stump. They took to jumping over them. This is not so simple as it sounds because stumps are of all kinds, and it might seem as if a different kind of jump would be needed for each kind of stump. In fact one Australian manufacturer did actually offer five hundred different kinds of stump-jump plows to suit different localities. They were practically made to order, but they had one thing in common: They knew how to jump stumps.

Mostly they were variations of the bridle-draft or spring-release types. With the bridle-draft type, the plow bottoms were kept in a working position by means of a bridle arrangement consisting of a chain fastened to an arm attached to each plow standard, with the other end of the chain connected to an equalizing bar to which all the chains, one for each bottom, were connected. These chains had enough play to allow each separate bottom, or plowshare, to jump without interfering with the work of the others. The bridle-draft

type was usually a five-furrow plow. The spring-release design applied more usually to a four-furrow disk plow. A spring was used to trip up the particular disk that was threatened with a stump, and the pressure of the spring automatically put the disks into their normal working position after the stump had been jumped. Stump-jump harrows as well were put to good use. Most of the ground was light and comparatively easy to work, once the trouble of the stumps had been supervened, so that even 12-furrow plows were occasionally used.

I have tried both plows, and I can testify that it takes an artist in tillage to jump a stump with either. I didn't have the faculty of the cow that jumped over the moon, but I could excuse my bad performance by saying that after all I was a seaman. Contrariwise, when I applied for a job on shipboard in those days, it was always in the guise of a farmer. The formula has its various advantages.

Except for the stumps, plowing was easy. The soil was light and friable. I never saw the red volcanic soil and vegetable mold of Queensland. Mostly the soil was black sandy loam mixed with sandy clay, thinning out to just a light sand. These soils lacked phosphoric acid and lime and needed superphosphates. The fertilizer grain drill imported from America dropped these with the seed. The stumps, of course, were still there, and the grain drills kept jarring into them. But the drills were solidly built, with a main axle of cold-rolled steel running in self-aligning bearings which hung in unbreakable steel brackets bolted to the sides. They could take a lot of grief. It wasn't often that the delicate mechanism regulating the flow of seed and fertilizer was thrown out of whack, although it was intricate enough and designed to deliver 12 speeds of sowing according to the soil. Because of the long, hot, dry summers, when rain simply could not be counted on, spring sowing was not likely to succeed. Autumn (*Concluded on page 330*)

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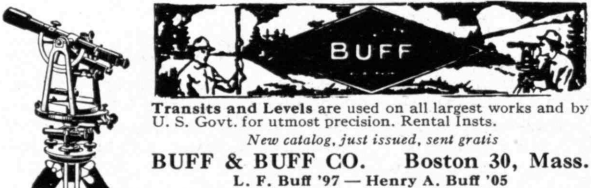
(Concluded from page 329)

or early winter sowing was best, and since, so to speak, it is June in January that far under the line, late April or May made early winter and was about the right time to drop the seed.

When I hired out to Paddy Rolfe at Little River, it was harvesttime. He was swinging a thousand-acre farm practically singlehanded, but for the harvesting he was willing to take on some part of the floating population, if only to keep from talking to himself. He expected his wife out from England in another year. Paddy introduced us to Australian harvesting machinery. This had taken first the form of a stripper that stripped the heads off the standing stalks and thrashed them. But the stripper dropped wheat and chaff unseparated into the same box. The chaff had to be winnowed clear, and that meant extra help. So the stripper-harvester was developed. This machine had a giant comb which combed the wheat up until the wheat ears alone projected through the comb. Then a drumlike gadget, revolving at high speed, broke the heads off and shot them into the body of the machine, where thrashing and separating devices made the grain ready for market. These stripper-harvesters, however, sometimes wasted grain. The drum, moving fast, would sometimes spit grain out over the comb. Paddy Rolfe had got hold of a new thing altogether, a reaper thresher, a Canadian importation that prevented such loss.

I sat on a perforated iron seat and drove four shaggy brown horses through the wheat. It was an easy life. I was no longer a fugitive. Nobody knew where I was. I hardly knew myself where I was, well enough to point to it on the map. I had a fine sense of security. I was neither driven by the past nor drawn by the future. My only troubles were the flies that stung my eyes. Ahead of me, boundless and rippling, the sea of wheat stretched away, a golden ocean of Dart's Imperial, White Tuscan, or Yandilla King — I don't recall the exact brand. The wheat looked bright and clear, solid in the straw, and, in this section, mostly beardless.

These were nearly my last days in the country — at least in the back blocks — and they were among my best days there. They fixed Australia in my mind as having an ethereal quality, a light, dry, golden look. Australia is a blonde, with its light sleepy blues and dry brittle yellows. I suppose I may have caught sight of the goddess Demeter once or twice, lying prone with a wreath of wheat around her brows. She was very attractive and seemed to fit well that scene of bareness and blueness and hazy immensity. . . . But of course the image was shattered the instant that, with a clashing jar, I fetched up against a stump.



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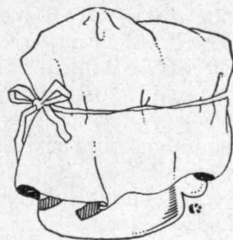
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CHECK LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI, OFFICERS, AND STUDENTS

Good for Them!

☐ LESTER D. GARDNER '98, Secretary of the Institute of the Aeronautical Sciences, elected honorary fellow of the Royal Aeronautical Society for his distinguished services to American aviation.

☐ ARTHUR S. KEENE '98, architect, elected to fellowship in the American Institute of Architects.

☐ GORHAM P. STEVENS '98, formerly director of the American Academy at Rome, named director of the American School for Classical Studies at Athens, Greece.

☐ FRANK C. STOCKWELL '07, head of the department of electrical engineering at Stevens Institute of Technology, Hoboken, N.J., appointed dean of the graduate school of that institute.

☐ KARL R. KENNISON '08, formerly assistant chief engineer of the Metropolitan District Water Supply Commission, Boston, appointed chief engineer of this commission.

☐ MARSHALL B. DALTON '15, President of the Boston Manufacturers Mutual Fire Insurance Company, appointed a director of the Merchants National Bank of Boston.

☐ EDWARD P. WARNER '17, aeronautical consultant, appointed economic and technical advisor for the Civil Aeronautics Authority, Washington, D.C.

☐ WALTER C. VOSS '32, Head of Technology's Course in Building Engineering and Construction, named special consultant on watertight brickwork construction for the United States Navy Department's new medical center, Washington, D.C.

☐ NATHALIA ULMAN '34, architect, engaged in restoring the George Washington homestead at Mount Vernon to its authentic 18th Century aspect.

☐ FLOYD E. ARMSTRONG, Professor of Economics and Finance, M.I.T., appointed a director of the Harvard Trust Company, Cambridge, Mass.

Sundry Society Doings

☐ CARLETON E. DAVIS '92 and CHARLES G. HYDE '96, elected honorary members of the American Water Works Association in January.

☐ WALTER R. MCCORNACK '03, made chairman of an American Standards Association committee to develop

standards for lathing and plastering.

☐ DEAN PEABODY, JR., '10, heard by the designers' section, Boston Society of Civil Engineers, on "Design of Flat Slab Floors of Unequal Spans," March 8.

☐ GORDON M. FAIR '16, elected president of the Boston Society of Civil Engineers, March 15. ARTHUR L. SHAW '09 was elected vice-president; HENRY B. ALVORD '07, a director, and CHARLES R. MAIN '09, reelected treasurer at this meeting.

☐ FREDERICK OHRT '17, heard by the Engineering Association of Hawaii on "Classification: the Present Situation and the Probable Future Effects on the Engineer," March 3.

☐ MARTIN J. BUEGER '24, heard by the Canadian Geographical Society on "Frobisher Bay," March 16.

☐ BERTRAM E. WARREN '24, heard by the Canadian National Research Council on "The Structure of Crystalline Silicates and Silicate Glass," March 29.

☐ Participated in the American Chemical Society's three-day program on petroleum progress held April 4 to 6: PER K. FROLICH '23, EGER V. MURPHREE '23, WHEELER G. LOVELL '24, EDWIN J. GOHR '26, CHARLES J. PEDERSEN '27, and MERRELL R. FENSKE '28. The vice-chairman of this society's colloid chemistry division, ERNST A. HAUSER, Staff, led a four-day symposium on the relations of colloid chemistry to petroleum production, University of Oklahoma, February 28 to March 3.

Written

☐ By FREDERICK G. CLAPP '01, a paper, "The Problem of Petroleum," *Bulletin of the Geological Society of America*, March 1. This was originally the anniversary day address at the semicentennial meeting of the society.

☐ By ROBERT B. SOSMAN '04, an article, "Quicker Than the Eye," *Scientific American*, April.

☐ By ALBERT E. WIGGIN '07, an article, "Making Employment Attractive at Anaconda's Great Falls Plant," *Engineering and Mining Journal*, March.

☐ By FRANK L. AHERN '14, an article, "Some Problems in Public Safety in Recreational Areas," *National Safety News*, April.

☐ By THOMAS K. SHERWOOD '24 and CHARLES E. REED '37, a book, "Applied Mathematics in Chemical Engineering," McGraw-Hill Book Company, Inc.

☐ By DONALD B. SINCLAIR '31, an article, "New Type 493 Vacuum Thermocouples for Use at High Frequencies," *The General Radio Experimenter*, March.

☐ By F. ROLF MORRAL '32 and JOHN L. BRAY '12, a paper, "The Anodic Solution of Alloys" (printed but not published), *The Electrochemical Society*, May.

☐ By ROY W. CARLSON '38 and Douglas McHenry, an article, "Measuring Dam Behavior," *Engineering News-Record*, March 30.

DEATHS

* Mentioned in class notes.

☐ CHARLES JUDKINS '71, February 4.

☐ RICHARD S. ATKINSON '75, last summer.

☐ FREDERIC R. LORING '79, April 1.

☐ GEORGE A. HOLMES '91, February 4.*

☐ DONALD W. ROSS, JR., '94, March 3.

☐ HENRY S. DUTTON '95, January.

☐ WILLIAM H. SELLEW '97, January 29.*

☐ GEORGE H. HIGGINS '99, November.

☐ HERBERT H. RIDDLE '99, February 28.*

☐ GUSTAF GUSTAFSON '01, October.

☐ FREDERICK L. MARION '02, July 29.

☐ FRED K. MERRIMAN '04, February 27.

☐ PHILIP R. LAMAR '06, May 20, 1938.

☐ JOHN C. BOLLENBACHER '09, March 4.*

☐ CHARLES BARKER '11, March 15.*

☐ JUSTUS C. SANBURN '12, January 15.

☐ RALPH MILLIS '16, November 11.

☐ ELMER HEATH '17, September 23.

☐ WALDO H. BROWN '20, April 4.

☐ AMOS H. STEVENS '22, March 12.

☐ JOSEPH S. WARD, JR., '22, March 2.

☐ WILLIAM C. DOYLE '34, March 18.

☐ EDWARD R. CLARK, JR., '35, March 28.

☐ WILLIAM P. WRIGHT '36, December 22.

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

M.I.T. Club of Akron

Akron had its long-awaited event on March 20. Early that morning the club officers were called for by the official chauffeur of the Goodyear Company and taken to Cleveland, where we met Dr. Compton at the Terminal Tower and took him back to Akron. We went out to the Goodyear offices, where we were met by the President, Paul Litchfield '96, who conducted us to the lovely dining room on the top floor. There we were greeted by a delegation headed by Ray P. Dinsmore '14 and Bob Moorehouse '14. After lunch Mr. Litchfield suggested to Dr. Compton that he take a trip in one of the Goodyear blimps which were in port at that time. That would be fine, agreed our President, so out we went to Wingfoot Lake, where the blimps are sheltered, and then for a trip in the brilliant sky that blessed Akron that day. Dr. Compton enjoyed this hugely, as well as the exhibition of the Goodyear home-coming that was opened for his visit. Three weeks ago Goodyear had its annual home-coming in connection with the celebration of the centennial of the discovery of the vulcanization of rubber and had a huge exhibition of the company's products. After this, Dr. Compton was taken to the University Club to rest before his talk to us in the evening.

At 7:00 P.M. the best crowd in the Club's history was present to greet him. After dinner Ray Dinsmore took charge of the meeting and introduced the President, who prefaced his remarks by saying that this was one of his two most pleasant duties: to speak to big crowds of such loyal Tech Alumni. The other pleasant duty was to hand out diplomas. "Now as far as unpleasant duties are concerned," he said, "well, have any of you gentlemen ever had anything to do with a budget?" To get down to the main part of his speech, he then read a letter that Charlie Locke '96 had turned over to him from your reporter, in which your reporter explained that the reason we were not to have the ladies out to hear Dr. Compton was the fact that maybe the ladies would cramp the President's style. Everybody howled at this, and your reporter crawled under a table in disgrace. Then with the aid of a beautiful collection of slides, Dr. Compton took us back to Tech. With each one he had a story of what our great school is doing and is going to do. With each slide our chests expanded a little bit more. It was really good to see the expressions on the faces of those who were out of contact with the Institute's affairs; they registered wonderment and pride. After his talk Dr. Compton kindly answered our multitudinous

questions, and it was with great reluctance that we packed him in a car and sent him downstate to one even more famous than he: the Mother of the Comptons.

Seventy-five of us had greeted him, and there were 12 from Cleveland. For this meeting we have to thank Dr. Compton himself and also Charlie Locke. In closing, we ask visiting Alumni not to forget the M.I.T. luncheon at the American Institute of Chemical Engineers' spring meeting, May 15, 16, and 17, here in Akron. Luncheon on Monday, May 15, 12:30 P.M. — JOHN T. COX, JR., '36, *Secretary*, 76 Corson Avenue, Akron, Ohio.

Technology Club of Albany

The first meeting of the 1938-1939 season was held at the Albany University Club on December 7 and was presided over by James H. Finley '25, President. Redmond Walsh's ('28) resignation as secretary-treasurer, a position which he so ably filled for the last five years, was accepted. Although the turnout was small, those present enjoyed a very fine group of colored movies of microphotography of wild life taken in the Albany area.

In January our popular President, James H. Finley, was transferred by the New York Telephone Company to Watertown, N.Y., which necessitated his relinquishing the duties of office to our Vice-President, William Scofield '23. Through the efforts of Bill Scofield and Burt Rickards '99, Honorary Secretary for the Albany area, arrangements were made for the winter meeting which was held on February 20. We were happy to welcome Dr. Compton at that time, and the 30 Alumni plus five prospective M.I.T. students who were present thoroughly enjoyed an interesting talk covering all phases of recent developments at the Institute. This privilege of meeting Dr. Compton was greatly appreciated by all. — CARL H. ANDERSON '27, *Secretary*, New York Telephone Company, 158 State Street, Albany, N.Y.

Atlanta Alumni Association of the M.I.T.

The Georgian Alumni held their annual reunion and dinner dance at the East Lake Country Club on the evening of March 10. This was one of the largest gatherings of local Alumni ever assembled here. An enjoyable evening was experienced, with music and amateur talent from the members and their wives.

The retiring President, Arthur K. Adams '13, introduced the newly elected President, Percy H. Thomas '93. Lawrie H. Turner '99 was reelected secretary.

The following members and guests attended: Mr. and Mrs. Arthur K. Adams '13, Mr. and Mrs. Hibbard S. Busby '14,

Mr. and Mrs. William E. Huger '22, Mr. and Mrs. Sidney B. Jewett '28, Lieutenant Commander and Mrs. Irving B. McDaniel '17, Mr. and Mrs. T. Edward Moodie '24, Harold C. McLaughlin '18 and Miss Dorothy Moncrief, Mr. and Mrs. Samuel H. Reynolds '22, Mr. and Mrs. Clarence B. Rogers '14, Mr. and Mrs. Walter J. Rountree '09, Mr. and Mrs. William J. Sawyard '01, Mr. and Mrs. Richard W. Smith '21, Mr. and Mrs. Percy H. Thomas '93, Roger W. Allen '27, Kenneth K. Ayer '26, E. Bennett Beede '35, Lawrie H. Turner '99, Calvin H. Mohr '33, Arthur L. Merrifield '33, Laurent deGiv'e '33, Charles A. Smith '99, Mrs. Violet Illges, Mrs. Otto Staib, and Miss Mabel Loeb. — LAWRIE H. TURNER '99, *Secretary*, The J. G. Dodson Laboratories, 611 Forest Avenue, Atlanta, Ga.

M.I.T. Association of Buffalo

In spite of snow and a high wind, about 40 men gathered at the Buffalo Catering Company's restaurant on Monday, March 6. Again the weatherman was very uncooperative, as our last meeting was held during the year's worst snowstorm and blizzard. John M. Gaines, Jr., '26, presided at the meeting.

After a fine dinner, we listened to a splendid talk by Dr. Wallace B. Hamby, fellow of the American College of Surgeons. His topic was "Surgery of the Nervous System." As an eminent neurological surgeon he was well qualified to give us an expert's talk on brain surgery — past, present, and probably future. Dr. Hamby concluded by answering numerous questions that were raised by the members about the spinal cord, brain, and so on. From the comments offered, everyone seemed to enjoy the subject and its presentation very much.

Following formal adjournment of the meeting, a number of members played bridge, pinochle, or poker. The evening proved that "it's always fair weather, when good fellows get together." — JOHN D. RUMSEY '33, *Secretary*, 245 Elmwood Avenue, Buffalo, N.Y.

Technology Club of Chicago

March 2 was a doubly significant day in the history of our Club: Karl T. Compton was our dinner guest and speaker; and the same occasion gave a rebirth to the Club through the election of new officers. The activities have, regretfully, been nearly nil since the death of our former President, Ross D. Sampson '13, two years ago. Based on their past achievements and interest in M.I.T., it is safe to predict a brilliant and substantial future for the Club under the guidance of these new officers: President, Edward Pennell Brooks '17, general factory manager, Sears, Roebuck and Company; Vice-President,

Ralph Sargent '18, Vice-President, Sargent and Lundy, Inc.; Secretary, Edmund G. Farrand '21, Secretary and General Manager, United Conveyor Corporation; Treasurer, Charles M. Billman '25, Assistant to Treasurer, Cowham Engineering Company.

The scene of this dinner was the Lake Shore Athletic Club whose facilities were open wide to the Alumni. The gathering started at an early hour, and when time came for the "Stein Song" at the tables, the spirit of good-fellowship reached an all-time high. After dinner Dr. Compton gave his timely expression of thought on "Academic Freedom," then opened our eyes and minds vividly with an illustrated account of records made at the Institute during the last year. It is a blood transfusion to Alumni to learn the vitality of such accomplishments. — Gus Bouscaren '04, the leader of our last year's drive for gymnasium funds, gave his staunch assistance as an admirable toastmaster. Penn Brooks, at the prompting of Dr. Compton, rose for a speech of acceptance, thanked his followers for their arduous efforts in his behalf in the whirlwind campaign, and gave assurance that the planks in his platform would remain to establish a sound foundation for an active Club. Anyone who knows Penn needs no assurance that his promises will amply be carried out.

High spots of the evening: The class yell of '38 met a spontaneous response from Louie Ferguson for his Class of '88 — 50 years apart! Western Union telegrams inscribed on frosted cakes gave humorous digs to their recipients, Dr. Compton, Gus Bouscaren, and Penn Brooks. A male quartet who really knew how to sing (which token means they were *not* Alumni) did right by our Tech songs, with volumes of assistance in the choruses from our Martinied members, about 200 of them. — Dr. Compton announced the nomination of Philip W. Moore '01 for term member of the Corporation. Phil replied most graciously and expressed hopes of maintaining the good work of Jim Barker '07, the retiring term member. This high honor to Phil strikes a most warm response in the hearts of the many Alumni who know of his years of fruitful work in our behalf. — Great emergencies always bring forth great men to handle them. This event was no exception — it produced Sherry O'Brien '17, who, when asked to do the job of dinner committee chairman, took it. For six solid weeks he gave his untiring efforts to an uphill grind of arousing many Alumni whom the Club had left slumbering for years. Results came. So let it be entered on the record that Sherry with his dinner committee put on an event which brought out the remark from some of our oldest Alumni that it was the most successful meeting we ever had.

Attending a luncheon for Dr. Compton at the University Club on the day of the dinner meeting were the following members of the dinner committee: Sherry O'Brien '17, Lonsdale Green '87, Philip W. Moore '01, Louis H. G. Bouscaren '04, John M. Frank '07, George E. Wallis '09,

Donald V. Williamson '10, Armand H. Peycke '11, Jabez H. Pratt '12, Robert W. Clyne '30, T. Bryce Spruill '31, Gene Cary '33, Simeon Van T. Jester, Jr., '34, Alfred S. Alschuler, Jr., '35, Goodwin deRaismes '37, Edward Pennell Brooks '17, James Elliott '25, Arthur H. Compton, Joel I. Connolly '16, Howard A. Simons '22, H. Felton Metcalf '22, Orr N. Stewart '23, Herbert W. Kochs '25, William Steinwedell '25, Frank D. O'Neil '25, John Drum '26, Richard B. Goble '28, G. Robert Orrill '29, and Edmund G. Farrand '21.

Here's a tip to the stay-aways from the March 2 dinner: Get on the band wagon; this is your Club and it's going places; we all want you with us. On March 23 a new executive committee came into being, consisting of about 50 keymen from nearly all the Classes and with Sherry O'Brien as chairman. The meeting was called at the Electric Club by Penn Brooks, President. Definite plans of action resulted. Some of the plans are these: a Chicago alumni directory to be published before the year is out, with Harold B. Harvey '06 as chairman of this committee; a new employment committee, with Bill Steinwedell '25 as chairman; a committee to draw an up-to-date constitution and by-laws, headed by Ralph Sargent '18. Thought is being given to a smoker in May and a field day in the summer. Plans are being made for frequent meetings of the recently graduated Classes, particularly '37 and '38, in which Leo C. McEvoy, Jr., '38, is actively interested. Robert M. Nelson '30 and Trevor K. Cramer '30 are planning a get-together for their Class. — EDMUND G. FARRAND '21, *Secretary*, 1200 Old Colony Building, Chicago, Ill.

M.I.T. Club of Northern New Jersey

The Club is very proud of its scholarship activities and of the men who promote and carry on this scholarship work. While most of the work falls on the shoulders of the scholarship committee, they have the wholehearted encouragement and support of the Club and its officers. In particular A. I. Phillips, Jr., '10, chairman of the scholarship committee, enjoys the praise and appreciation of the Club for his untiring efforts in behalf of the scholarship work. Because we wish other clubs to know what the New Jersey Club is doing, we have persuaded Al to give the following brief résumé of what has been accomplished for deserving boys in our district:

"With the beginning of a new year, the work of the Club's scholarship committee is found to be actively under way. Last year 45 applicants for first-year scholarships were investigated, interviewed, and appeared before the committee; and it is anticipated that 1939 will bring forth at least that many.

"At the club smoker on November 18 the committee reported that the winner of the full-tuition regional scholarship for the school year 1938-1939 was Herbert F. Harvey of Norwalk, Conn., a grad-

uate of the Ramsey, N.J., high school. Freshman competitive scholarships, carrying a maximum of about one-half tuition, were awarded 25 other boys, and 16 of them are now at the Institute, the rest having gone elsewhere. New Jersey boys now in their second year at the Institute won their fair share of scholastic honors. William R. Ahrendt of Westfield, Robert D. Coombs of Ridgewood, David B. Hoisington of Upper Montclair, and J. J. Kriz of Bloomfield won four of the 25 coveted book awards given for excellence in one of the five major freshman subjects. These unique awards consist of handsomely bound books, appropriately inscribed, which are presented by an officer of the Institute, on behalf of the boy winning them, to the school from which the boy was graduated.

"During the past summer and fall the Northern New Jersey territory was carefully divided into 29 districts, and in co-operation with the Institute, each of these was assigned to one of the 29 Honorary Secretaries in the area. As a result, all admissions and scholarship cases are assigned automatically to the Honorary Secretary most familiar with the district and most conveniently located for all concerned."

The members of the scholarship committee under the chairmanship of Phillips are J. P. Maxfield '10, W. I. MacNeill '17, John Mills '09, and C. A. Clarke '21, President of the Club. — CLAYTON D. GROVER '22, *Secretary*, Whitehead Metal Products Company, Inc., 303 West Tenth Street, New York, N.Y. FREEMAN B. HUDSON '34, *Assistant Secretary*, Colgate-Palmolive-Peet Company, 105 Hudson Street, Jersey City, N.J.

Technology Club of New York

Karl T. Compton was the principal speaker at the At Home Dinner which was held on March 6 at the new clubhouse, 24 East 39th Street. More than a hundred members and their guests were present. Preceding the dinner the group made a tour of inspection of the building. There were many enthusiastic comments on the excellent appointments and facilities which the new quarters offer.

President Compton congratulated the members on their wise choice of location. He indicated that the Institute considers the alumni clubs important outposts in the general organization for operating a large and successful educational center. He expressed the conviction that our Club would continue to grow in scope and membership.

Lansing Chapman, President of the Williams Club, welcomed the gathering into that club's building. He extended greetings to all members and stated his belief that the association of the two clubs would be a lasting and happy one. Mr. Chapman extended an invitation to all Tech men to attend the smoker which his club was giving on March 30, so that the Tech members could become better acquainted with the Williams members of the club.

The Class of 1934 held a very successful dinner meeting on March 22. More than 30 members of the Class were present. The Class planned another dinner for April 26. — On March 16 the Class of 1916 held a dinner at the Club. The event was considered very successful and a similar one was planned for the near future. — Charles P. Fiske '14 arranged a dinner to be held on April 6 for his Class.

The Club will maintain a desk throughout the summer, so out-of-town visitors may register and determine quickly which of their friends are in town at the same time. — ROBERT EMERY '34, *Secretary*, 24 East 39th Street, New York, N.Y. CONSTANTINE S. DADAKIS '34, *Publicity Committee*, 644 Riverside Drive, New York, N.Y.

Niagara Falls Technology Club

Twenty-eight Alumni from Niagara Falls and vicinity attended the meeting of the Club on March 3. After a very enjoyable meal at the Niagara Club the members proceeded to elect the following gentlemen as the officers for the present year: President, Marion B. Geiger '28, Oldbury Electro-Chemical Company; Secretary-Treasurer, Michael G. Kelakos '35, Mathiesen Alkali Works, Inc. The above officers succeeded Burnham E. Field '15 and Calvin H. Mohr '33, respectively.

The *pièce de résistance* of the affair was an enthusiastically received talk by Walter G. Whitman '17. Professor Whitman described recent changes and developments at M.I.T. so vividly and interestingly that the entire assemblage was transported back to a spot of land they love so much. Professor Whitman was accompanied by George A. Akin '38 of the Buffalo branch of the Chemical Engineering Practice School.

No definite date has been set for the next meeting, but I believe it will be sometime in the summer, when we will hold our annual picnic. — MICHAEL G. KELAKOS '35, *Secretary*, 321 First Street, Niagara Falls, N.Y.

M.I.T. Club of Western Pennsylvania

The first meeting of the new year (February 23) took place as usual at the University Club, with a group of over 50 men present. Lawrence W. Bass, assistant director of the Mellon Institute, was well qualified to talk on "Economics of Chemical Engineering." He feels that the next few years will offer a steady, but not an increasing, demand for the college-trained chemical engineer. In the near future many chemical industries will have acquired their quota of college men. This is no cause for alarm, however, as Dr. Bass feels that there is an unlimited field for the chemical engineer in the growing field of food engineering, particularly in the canning industry. The chemical engineer has been amply trained to fill important positions in this ever growing field. Dr. Bass is convinced that in three or four years a new scientific ap-

proach must inevitably be given to the food industries. Lengthy but interesting discussions followed this stimulating talk. — ROBERT A. OLSEN '35, *Secretary*, 5655 Elgin Avenue, Pittsburgh, Pa. STANLEY T. JOHNEON '36, *Review Secretary*, Schenley Arms Apartments, Bigelow Boulevard, Pittsburgh, Pa.

Washington Society of the M.I.T.

The Society held its February meeting on the 17th at the usual place — the Mirror Room of the Lafayette — at 5:00 P.M. We continued the preferred dinner meeting program rather than the buffet supper. Newcomers introduced included Henry C. Smith '12, an architect in Kansas City, Mo.; Major Mabbott '12 of Fort Belvoir, Va., who is working on searchlights for the Engineering Board; and Thornton W. Owen '26.

Ed Merrill '09, our Vice-President, serving in the absence of President James '07, who was still in South America, introduced George W. Harris, veteran photographer of Harris and Ewing, who has photographed every president and cabinet since the days of Theodore Roosevelt. This day happened to be his 34th anniversary in business in Washington as Harris and Ewing, but represented his 50th in photography, and the 100th since invention of the art. To say it was a most enjoyable meeting is expressing it mildly. Harris projected on the screen pictures of every person of prominence, but the most interesting angle was the personal anecdotes accompanying the showing. He has made over 600,000 photographs, and more prominent people have come through his door than any other in Washington except the White House. Alone of all the photographers at the Peace Conference in 1919, with the aid of Mrs. Woodrow Wilson, he prevailed upon the 86 delegates to sit for their portraits. One of his early successes was the first picture of the president's cabinet in the cabinet room. When he had expressed his doubt of the possibilities of such a picture, Roosevelt had retorted: "You don't know; why don't you say you can, and find a way to do it?" Which he did. Other anecdotes included Teddy Roosevelt's notebook memory system. Harris considered him his most interesting subject and the greatest man he had ever known, one who enjoyed life to the full. His picture of Markham, the poet, he considered one of the greatest heads he had ever "made." Taft he remembered as the man who had filled more jobs than any other, telling how he and Penrose had ordered a complete dinner and then repeated the order when Harris ate with them in Atlanta. Hughes he considered the brainiest and one of the keenest men in America. Princess Alice he described as the woman whose picture practically every woman visiting his studio asked to see, after that of the president's wife. Joe Cannon and Princess Alice were his most photographed subjects. We were regaled with stories about Colonel House, Cary Grayson, Wilson, Albert of Belgium, Edward, Prince of Wales, General Robertson of

War days, Arthur James Balfour, "the other smartest man," Lenin, Lloyd George, Foch, Pershing, Prime Minister Bill Hughes, the man whose hearing confused the doings of the Peace Conference where he represented Australia, Lawrence of Arabia, Harding, Cal Coolidge and Grace, the Kings of Siam and Sweden, and the glamorous Queen Marie.

Regardless of what we may think of Franklin D. Roosevelt as a statesman or politician, Harris thinks he is the most marvelous man, in one respect, that he has ever met. He can turn visitors that enter like raging lions into such a mood that they always leave asking for an autographed photograph. In closing, Harris said: "You have seen and heard personal stories about 40 real, live people. I am proud of them and feel that I am the same as when I was born except for what I have gained from meeting them. It makes me wonder if we are all using our own possibilities as they have done."

The subsequent dinner was enjoyed by the following Tech men and guests: F. E. Brown '93, Charles G. Abbot '94, Joseph W. Clary '96, Nathan C. Grover '96, Marshall O. Leighton '96, Proctor L. Dougherty '97, Frederick A. Hunnewell '97, Charles H. Godbold '98, Frederic W. Southworth '00, Allen B. McDaniel '01, Merton L. Emerson '04, Amasa M. Holcombe '04, Bertrand L. Johnson '05, Ben E. Lindsly '05, Edward T. Steele '05, Ralph E. Tarbett '05, C. T. Leeds '06, Edwin Hahn '09, Edward D. Merrill '09, Ernest L. Patch '10, C. Phillips Kerr '11, Harold C. Mabbott '12, Henry C. Smith '12, Benjamin F. Thomas, Jr., '13, Henry H. Thompson '13, Frank L. Ahern '14, Alfred E. Hanson '14, Frank E. Richardson '16, Louis J. Grayson '19, Al F. O'Donnell '19, George W. Anderson '20, Kenneth Bernard '22, Rudolf H. Blatter '22, William K. MacMahon '22, Robert K. Thulman '22, Edmund S. Pomykala '23, G. Donald Fife '24, Chester H. Hosmer '25, Harry B. Swett '25, Thornton W. Owen '26, Frederick W. Willcutt '27, Raymond Underwood '29, Gordon R. Williams '29, Albert F. Bird '30, Jules A. Larrivee '30, Ormond M. Lissak '30, Freeman G. Corkum '31, Horace L. Woodward, Jr., '34, Charles L. Wright, Jr., '34, Dee M. VanCott '36, David A. Werblin '36, John Lowe, 3d, '37, Richard L. Steiner '38; guests, George W. Harris, Louis Boughton, and H. L. Woodward.

The Society held its March meeting on the 17th at the Lafayette Hotel at 5:00 P.M., continuing the preferred dinner meeting program. Vice-President Merrill '09 was in the chair again substituting for President James '07, who had sent us a letter from La Paz, Bolivia. President James told of his difficulties during the earthquake, when he felt the shock from the fifth floor of his hotel room, and of his further difficulties in getting by steamer and train to La Paz.

Members accorded special introductions by Proctor Dougherty '97 included Minor S. Jameson '96 and his son, Minor S., Jr., '34; George W. Stone '89, just back from Mexico; W. Lorrain Cook '03, a

consistent attendee; Harry A. Whiton '01 of the Procurement Division; Herbert W. Kenway '05 of Boston; Colonel Stuart C. Godfrey '07, Commander Patch '10 and his guest, Captain L. C. Craigie of the United States Army Air Corps; Louis Simon '91, supervising architect of the Treasury Department; Julius E. Nolte '98; and William C. Mehaffey '17.

We were privileged to hear again W. Chapin Huntington, former commercial attaché at Moscow, who described "Russia Up To Date." Huntington, a professional engineer as well as a former commercial attaché, portrayed Russia vividly, bringing up to date the talk he had given to the Society several years ago. His talk was unique in that it appeared to represent a dispassionate discussion based on impartial findings by a competent observer who had nothing to sell. In view of the present state of affairs over there the talk was most apropos. Russia, with an area two and a half times that of the United States, has tremendous problems in transportation and government, with mineral wealth far away from the center of population. Landlocked generally, beset with difficulties of cold climate, and condemned, in a way, to backwardness by these factors, from Peter the Great to Stalin, the system has been to swing the lash to overcome these conditions. Too little rain largely overcomes the advantages of fertile grain lands, leading to feast or famine. Although the population is three-quarters Slovak, the remaining quarter is composed of 180 nationalities speaking 150 languages and dialects. Huntington described vividly the democratic tolerance characteristic of the Russian, stating that the patience and tolerance stretched to laziness and indolence and describing how an American foreman in leaving a farewell party in Moscow exclaimed, "God, I just hate to go, I just love these babies," as he swallowed his Vodka.

This land of paradoxes is a tremendous syndicate, with production 99 per cent socialized and collectivized; it is state capitalism with a vengeance. Predominately agricultural, its main problem revolves around the huge collective farming situation. Run from Moscow with 5,000 motorized tractor stations and half a million tractors, instead of taxes thus labeled, the government gets 20 per cent to 25 per cent of the grain, some more is assessed to support the motor tractor stations, more is taken for taxes and insurance as such, some is set aside for the seed fund, and the balance is sold or divided by the participants in the collective project. Although Russia is second in the world in steel production and in railroad trackage, in view of its breadth it is terribly underequipped. We see the modern version of a despotic government trying to catch up and surpass as it has done since the days of Peter the Great. We also see there a version of the world-wide tendency to collectivism, a form of the widespread neurosis of seeking salvation through dictatorship, frightful waste, high cost, browbeaten executives and engineers and driven workmen, violence and force used to accomplish the purpose.

Huntington says the revolution is still going on. Divorce is harder, abortions prohibited, Russian history and patriotism taught and encouraged, and education not belittled, and men paid on a basis of man-hours established in accordance with a multiplier based upon the value of the type of work done. He showed many posters which vividly portrayed the effort to encourage care in the repairs of mechanical equipment, attitude toward Fascist countries, encouragement of home life, stirring of industrial production to greater heights, and so on.

The many questions offered after the discussion indicated the popularity of the subject and the interest of M.I.T. men in finding out what is really happening on the other side of the world. With respect to military power the opinion was expressed that Russia was still handicapped greatly by its transportation system, the vulnerable location of its oil wells, and the general lack of facilities, but any invader would have similar difficulties and could expect a reception such as Napoleon received.

The following M.I.T. men and guests were present at this enjoyable monthly gathering: George W. Stone '89, Louis A. Simon '91, Ferdinand T. Schneider '92, George W. Stose '93, Frederick E. Fowle '94, Minor S. Jameson '96, William H. McAlpine '96, George E. Stratton '96, Proctor L. Dougherty '97, Carroll Benink '98, Julius E. Nolte '98, Henry C. Morris '00, John Boyle '01, Harry A. Whiton '01, W. Lorrain Cook '03, Amasa M. Holcombe '04, Frank W. Milliken '04, John C. Damon '05, Herbert W. Kenway '05, Ben E. Lindsly '05, Louis H. Tripp '06, Stuart C. Godfrey '07, Edward D. Merrill '09, Kenneth P. Armstrong '10, Ernest L. Patch '10, Archibald W. Laurie '12, Benjamin F. Thomas, Jr., '13, Frank L. Ahern '14, Alfred E. Hanson '14, Warren N. Watson '14, Frank E. Richardson '16, William C. Mehaffey '17, Joseph Low '18, Louis J. Grayson '19, Al Francis O'Donnell '19, Merritt P. Smith '19, Maximilian Untersee '19, George W. Anderson '20, Percy R. Taylor '21, Kenneth Bernard '22, William K. MacMahon '22, Robert K. Thulman '22, Paul J. Culhane '23, Edmund S. Pomykala '23, George H. Southard, 3d, '23, Felix Stapleton '24, Henry C. Hoar '25, Howard F. Smith '25, Joseph Y. Houghton '26, Theodore L. Soo-Hoo '26, Roland L. Hutchings '28, John A. Plugge '29, Raymond Underwood '29, Gordon R. Williams '29, Albert F. Bird '30, James George '30, Oliver G. Green '30, Amerst E. Huson '30, Mario Caputo '31, Henry D. Randall, Jr., '31, Minor S. Jameson, Jr., '34, Richard L. Parli '35, Marshall M. Holcombe '36, J. Ross McKeever '36, James J. Souder '36, John Lowe, 3d, '37, and Richard L. Steiner '38; Guests: W. Chapin Huntington, speaker of the evening, Captain L. C. Craigie, H. L. Godfrey (Pennsylvania '18), J. H. Payne, A. L. Rogers, P. M. Vassil (Michigan '34). — ALFRED E. HANSON '14, *Secretary*, 3424 Quebec Street, northwest, Washington, D. C. WILLIAM K. MACMAHON '22, *Review Secretary*, 818 25th Street, South, Arlington, Va.

CLASS NOTES

1877

Our classmate George Franklin Quinby died at the Chelsea Soldiers Hospital on February 13. He had been ill about one month. He was the son of Benjamin Franklin Quinby and Betsey Hallet Quinby. He was born in South Boston on December 31, 1858, where he received his education previous to his entering Technology. He married Grace Clifford Wharf of Gloucester, Mass., August 14, 1930, who now survives him. Their home was at 1 Shenandoah Street, Dorchester, Mass. George was the United States property and disbursing officer at the State House, Room 185. He was a member of Hope Lodge, Free and Accepted Masons, Dorchester, Mass. He was a former member of the Boston Fire Department and a former member of the Ancient and Honorable Artillery Company of Massachusetts, also a member of the American Legion, from which he received the honorary title of colonel.

George was an excellent mechanic, having taken out a number of patents and, in a well appointed workshop in his home, constructed many appliances. A very fine model of the Minots Ledge lighthouse which he built occupies a prominent place in his den. It has a revolving light, giving the 1-4-3 message. He was interested in firearms and was an excellent marksman. In his den is a very fine model of an old steamboat engine with boiler, all inclosed in a glass case. This model he wanted the M.I.T. to have for exhibition. His passing reduces our number to 21 whose addresses are known. We shall all miss George when we meet at our class reunion.

For some time I have been trying to get our classmate Francis H. Bacon of Channahale, Turkey, to send us an account of his trip to Athens. Having been there and being interested in its history, I felt sure it would be of interest to his classmates. His two letters to me will be the best introduction to the diary following: "... This is a terribly belated answer to your two fine letters: The first, of last September, with the account of your 'high jinks' the Lord of Islesford in the Bar Harbor *Times*, and I ought to have answered that at once but I was way behind with my letters and you were off to Nassau, Cuba, and God knows where with the Ancients and Horribles (no, not that), but I waited, and now comes yours of December 27 arriving yesterday [January 13] and of course it's too late to send you any of my Athens experiences, for here again the desk in front of me is piled high with unanswered mail. So all I can do is to send you this brotherly greeting and if I can get hold of my Athens diary, I'll send you some of it, but I think the Tech boys must be tired of the reminiscences of the old fellows. You seem to be toughest of the lot! ... Thanks for the clippings of Trinity Church chancel. We saw that church being built during 1874 and 1875. I left Tech in the spring of 1876, having finished all the architecture I

1877 Continued

could get there, and Ganot's physics and Gaetano Lanza's formulas on the black-board bothered me, so I went out into the world.

"And now you are getting over the hurricane and thinking of when to plant your potatoes; I sit in an easy chair and dream of Athens, while China and Japan cut each other's throats; Hitler and Mussolini will skin Chamberlain again; England digs rabbit holes in Hyde Park, makes gas masks for the royal family, and the dear public pays taxes; Roosevelt — guess I'd better shut this off here and seek that easy chair. Good luck to you, my boy, and love to '77. . . ."

"Your letter of February 6 is just received and you have surely been up against it with hurricane: the bad thumb, which I hope has healed by this time. I myself have had a sad blow by the death on January 7, by heart disease, of the wife of my son Fritz, and it has taken some time for me to collect myself, especially as I was none too well at the time. My son, who had much business trouble, has now found himself again and with the help of loving friends and three splendid sons is facing life again with renewed courage. We all have to take what comes, and it is loving friends and happy memories that keep us going. I certainly have had much of interest during my life and as a windup that experience I had in Athens last spring was about top notch. I inclose a part of my indiscreet Athens diary, much of which you won't understand, but you can see it was very real to me. . . . Here I am anchored on the Hellespont in fairly comfortable surroundings but no money to get away and where would I go even then! So live here surrounded by many books and listen to the radio about what crazy people elsewhere are doing. I read Tacitus which describes the decadence and awful corruption of the Roman Empire that Mussolini hopes to bring back. Well, let's drop it and let the world go hang. All I know is I don't intend to buy any gas mask. . . ."

Having finished our introduction, we find that The Review can't allow us enough space in this issue to continue, so we are going to save Bacon's diary itself to run in the next issue. We know you will look forward to it. — BELVIN T. WILLISTON, *Secretary*, 3 Monmouth Street, Somerville, Mass.

1881

The death of Frederick T. Walsh on February 4 was announced in the April issue of The Review. In addition to this brief statement we wish to express the sorrow of the Class and to append this account from the Boston *Evening Transcript* of February 7: "The funeral of Colonel Frederick Thomas Walsh, president of both the Thomas Leyland Machinery Company and the Leyland Walsh Company of Readville, will be held at 11 A.M. Thursday in his home at Littleton, N.H. He died Saturday at the age of 79.

"Colonel Walsh, born in Pawtucket, R.I., was graduated from the Massachusetts Institute of Technology as a chemical engineer. Later he became an assistant

to his father in the Hamilton Print Works, Lowell, and was associated with the Leyland interests in Readville.

"He was a 33d degree Mason, Knight Templar, former president of the Drysalers' Club, and a member of the Cotton Manufacturers' Association and the Textile Club. Surviving are his widow, a daughter, Mrs. Charles R. Lindsay, 3d, of St. Charles, Ill., and two sons, Thomas B. Walsh and Frederick B. Walsh of Boston. — FRANK E. CAME, *Secretary*, Chambly Canton, Quebec, Canada.

1888

Soon after reading these notes all '88 men will receive a special invitation to be present at our 51st reunion and "Ninth Webster Class Dinner" at the home of our President, Edwin S. Webster, 307 Hammond Street, Chestnut Hill, Mass., at seven o'clock on Sunday, June 4. You are requested to arrive at about six o'clock for inspection of the gardens and grounds. Dress will be informal.

After dinner our President will give us an account of his trip with Mrs. Webster to Vancouver to visit their daughter and grandchildren, San Francisco Golden Gate International Exposition, New Orleans, and Parkersburg, W.Va. The movie reel taken by Walter Shaw at our 40th reunion at Chebeague Island will be shown again for the benefit of those who have not seen it, as well as the enlargements of snapshots taken by Everitt Taylor at our 50th reunion at Marblehead. Those going by automobile from Boston turn left from Beacon Street into Hammond Street; it is the fifth house on the right with a high stone wall. Boston and Albany Railroad train leaves South Station at 4:45 P.M., daylight-saving time. Cars will be waiting on arrival at Chestnut Hill Station. If you expect to be present, please advise Fred J. Wood, 2 Colliston Road, Brookline, Mass., as your Secretary will be at Chebeague Island, Maine, on and after May 1, coming down to the reunion and dinner, which he guarantees to be better, though smaller, than our glorious 50th.

Ned Webster has been president of the Massachusetts Horticultural Society for more years than your Secretary can remember of the 110 years since it was organized. The society is by far the largest of its kind in the country, with 9,000 members. The spring flower show put on by the society from March 16 to 21 in Mechanics Building, Boston, was a record breaker in many ways. Over 15,000 people were in attendance on one of the days, one man flying from Oakland, Calif., especially for the show. Those members of the Class who have seen Ned's gardens and conservatories at Chestnut Hill will not be surprised to know that he won the Gold Medal of the Pennsylvania Horticultural Society for his exhibit of orchids, a special prize for his spring garden of growing tulips and other spring flowers, as well as awards of merit for Cattleya hyperion and Cypripedium Joan Harris.

On April 1 Ben Buttolph retired from the Factory Mutual Fire Insurance Companies of Providence, R.I., on account of the age limit. He finished 50 years with

the association last August and 47 years in the Manufacturers office, December 1. He will retire to his summer home at Saunderstown, R.I. Very few of us have served 50 years continuously with the same association or company. Ben can now take up his favorite hobby, which may be factory insurance, like the street-car driver who went for a streetcar ride on his day off.

Fred Nichols deserves a vote of thanks for sending to 36 of the 41 present at our 50th, the results of the census he took at the last breakfast of the reunion. He was very lucky to get all but five on his list, which he sent out on February 10. Among the interesting facts we have gleaned from this list are that Bates is a milkman; Taylor is going in for etching; Faunce is a clambake engineer; Ferguson has been 48 years with Commonwealth Edison, Chicago; Bird, 47 years and still going with Royal Baking Powder Company, as control chemist; Besler, 50 years continuous railroad service; Merrell, county commissioner, Cincinnati, Ohio; Eastman, leather industry engineer, retired; Ellis, superintendent of public works, Melrose, Mass.; Foque, retired general mechanical superintendent, Minneapolis, St. Paul and Sault Ste. Marie Railway; Meade, Cleveland City Planning Commission — hobby, music; Stetson, editor; Sjöström, consultant; and Nichols, retired principal, public schools of Chicago. Thank you, Fred, for all this up-to-the-minute information about the men of '88.

As you will note, your Secretary is now back on his native soil — the state of Maine and Casco Bay — where he has spent 56 summers but only a few winters, and where he will have nothing to do but garden, golf, swim, row, sail, and play with his three grandchildren. Come down and help him do it. — BERTRAND R. T. COLLINS, *Secretary*, Chebeague Island, Maine.

1889

To an eager constituency the Secretary is able to release the following regarding the approaching 50th anniversary: On the morning of Saturday, June 3, the Class will depart from Boston to a point on the seashore (to be announced later) where we will stay until late Sunday or possibly Monday morning, when we will return to Boston in time for the Alumni Day doings on the latter day. At these doings a participation of especial honor as the 50-year Class will be assigned to us at the evening banquet. The doings at the seashore will be of a threefold nature, consisting of a *Putsch* in the direction of general conviviality, a *purge* of all and every care and worry, and a *party* of a memorable sort. Details will be released later.

L. E. Johnson wrote from West Palm Beach, Fla., where he spent the winter, that he planned to be back at the Sayre Apartments, Bethlehem, Pa., about April 1. He says he saw Victor Windett in St. Petersburg, Fla. (314 24th Street, North), looking hale and hearty. R. D. Hall's home address is 71 Highland Street, Amesbury, Mass. His business address is now the Merrimac Hat Corporation.

You will find on page 1 information on Alumni Day, June 5

Albert Sauveur, our famous metallurgist, died January 26. The following notice appeared in the *Mining World and Engineering Record* of London: "Readers, especially those interested in the Iron and Steel profession, will learn with regret of the death last week in the U.S.A. of Professor Albert Sauveur, at the age of 76, after a brief illness. Sauveur was born at Louvain, Belgium, in 1863, was educated at schools in Brussels and Liège, and entered the Massachusetts Institute of Technology, obtaining his diploma, after specializing in Mining and Metallurgy, in 1889. After a brief period of service as Chemist to the Pennsylvania Steel Co., he became Superintendent of the Research Laboratories of the Illinois Steel Co., Chicago, which post he held for a period of five years. He was appointed Instructor at Harvard, in 1905, after having been lecturer at the Massachusetts Institute of Technology for several years. From 1905 to 1924 he held the post of Professor of Metallurgy at Harvard, and from the latter date until 1935 he was the Gordon McKay Professor of Metallurgy and Metallography, and finally Emeritus Professor in 1935. Last year he was selected to deliver the thirteenth Edgar Marburgh Lecture at Atlantic City. Sauveur was famous all over the world for his metallurgical knowledge and his writings on metallography and the heat treatment of iron and steel. During his life he published more than 150 articles and papers on these subjects and his classic volume, 'The Metallography and Heat Treatment of Iron and Steel,' has for many years been recognized as a standard work. . . ."

"Professor Sauveur was the recipient of numerous honours from various Governments and Institutions. A Chevalier of the Legion of Honor, Officer of the Order of Leopold, and an Officer of the Academy of France, Sauveur was awarded the Iron and Steel Institute of Great Britain's medal, the Elliott Cresson Gold Medal of the Franklin Institute, and was the first to receive the Sauveur Achievement Medal, which was established in his honour by the American Society for Metals. Professor Sauveur was awarded a number of honorary degrees, including the D.Sc., from the Case School of Applied Science, the Grenoble University and the University of San Marcos. Both Harvard University and the Lehigh University awarded him Honorary Doctorates. He was a member of many societies, and received numerous honorary memberships, and during the war he acted as Metallurgical Expert to the French Ministry of Munitions. Professor Sauveur took an active part in technical journalism and was founder and editor of the *Metallographist* and the *Iron and Steel Magazine*. Among his numerous activities he was associated with the American Society for Metals from its inception, and served on the Executive Committee of that body. He was also Vice-President of the American Institute of Mining and Metallurgical Engineers from 1910-1912. Sauveur was a man of striking personality, and a definite charm of manner gained for him a wide circle of friends. . . ."

Frederic S. Boutwell died in Andover, Mass., on February 16. The following notice appeared in the *Boston Evening Transcript*: "Frederic Samuel Boutwell, vice president of the Andover Savings Bank, died suddenly today in Phillips House, Boston, at the age of 72. Born and educated here, Mr. Boutwell attended the Massachusetts Institute of Technology. Later he entered the employ of the Andover bank, and eventually became its treasurer. He served in this capacity for more than 25 years, and three years ago was made vice president. He was a member of many banking associations, the Grange here, and affiliated societies of the West Parish Church. Mr. Boutwell unmarried, leaves two brothers, Arthur P. Boutwell and Winthrop Sherman Boutwell; and a sister, Miss Alice J. Boutwell, all of this town. Although funeral arrangements had not been completed, burial will be in the family lot at West Parish Cemetery." — WALTER H. KILHAM, *Secretary*, 126 Newbury Street, Boston, Mass.

1891

Our notes for this month will consist chiefly of an attempt to express our sense of loss and our respect for two classmates who have passed on during the last two months. Both George Holmes and George Hooper were, to many of us, old and tried friends; both were prominent and highly regarded in their undergraduate days; both continued their interest in Technology and class affairs, frequently attending our dinners and reunions throughout the year. We shall miss them.

George Holmes was ill at his home in Newton Center, Mass., for some time, and his passing was therefore not unexpected. He died on February 4, and the funeral services were at his home. He leaves a wife and three children — one daughter and two sons. One of his sons is married and has three children. George was one of the few who started Course X at Tech. Ned Cunningham, Billy Bryant, and F. Campbell Moore, also Course X men, passed on some time ago.

George was always athletic and while at Tech played football and baseball. For many years he and Mrs. Holmes belonged to a bowling club of which your Secretary and his wife were members. He was naturally of a retiring disposition but a "kindly gentleman" with many friends. He had a fine voice and enjoyed singing. For some years he was superintendent in charge of development work for the United-Carr Fastener Corporation of Cambridge, Mass.

George Hooper, while living far away from most of us, had kept in close touch with the Class by correspondence and contacts with our classmates on the Coast until within a few days of his death on February 9. He had lived in Pasadena many years but continued active in our class affairs in that part of the country. Every few years he came East, and not long ago we had a Boston dinner for him.

Those who read *The Review* may remember him best for his frequent interesting letters of his trips and experiences,

mostly written to Barney Capen. George was a past master at letter writing, sometimes 15 to 20 pages of longhand, reading like an interesting travel book. It seems only a few days ago that your Secretary received the whimsical comment that George Hooper's letters would have to be used as a serial. And to think that we will never again have the pleasure of reading these stories of his many auto trips in the Far West country. George had a lovely home in Pasadena where he and his family have entertained many Tech men and their families. Several of us were out there summer before last. Since then another daughter has married.

The Class could not have had a more loyal member. He was active in Tech affairs and kept in touch with our men in that vicinity, of whom there were some ten or more on the Coast. He had every intention of attending our 50th and also bringing others along with him.

The following, from a Pasadena paper, gives some idea of his activities: "George Kennard Hooper, 70, former assistant city manager and former city engineer of Pasadena, died early today (February 9) at his home, 1075 Armada Drive, Pasadena, Calif. Mr. Hooper was stricken with a heart attack two weeks ago and had been confined to bed until he passed away this morning at the family residence. Funeral services will be held Saturday at 3 p.m. at the Neighborhood Church, with the pastor, Dr. Theodore G. Soares, officiating. Born in Boston, Mass., July 1, 1868, Mr. Hooper received his early education there, and was graduated from Massachusetts Institute of Technology in 1891 as a mechanical engineer. His ability received early recognition, and he became connected with the Deering Harvester Company of Chicago, and later with the Abendroth and Root Company of Rochester, New York, as industrial mechanical engineer. In the early 1900's he founded the Hooper-Falkenau Engineering Company of New York City, a consulting firm. During the World War he served his country as a Lieutenant-Colonel in the Ordnance Department in Washington, D.C., having charge of production of tanks, trucks, and tractors for the Army.

"He retired from active business in New York City in 1920, and came to Pasadena in 1921 to retire. But his great ability was still needed and he became assistant city manager of Pasadena in 1924. Mr. Hooper resigned as assistant city manager July 1, 1925, again expecting to live a retired life. But again his services were in demand, and he was chosen city engineer in 1929. He resigned this position in 1931, and had lived quietly with his family since that time, devoting himself to church and club activities. During his city engineer regime, Mr. Hooper served on a special tax and budget reduction committee, and also as an organization efficiency expert.

"He was a member of the Twilight and Markham Clubs of Pasadena; the Harvester Club, made up of men who formerly worked for the Deering Harvester Company; he also belonged to the west-

1891 Continued

ern Society of Engineers, and to the Neighborhood Church here, where he was treasurer and a member of the board of trustees. Mr. Hooper, who traced his lineage to the distinguished Adams family of New England, always had been intensely interested and active in the alumni association of his alma mater, M.I.T. Surviving Mr. Hooper are his wife, Mrs. Mary Leverich Hooper; two daughters, Mrs. Everett R. Smith, Pasadena, and Mrs. Henry B. Belden, Boulder City, Nev.; a son, Duncan L. Hooper, Pasadena; a sister, Mrs. Hooper-Wakefield, Dedham, Mass.; and a grandchild, Molly Kennard Smith, Pasadena."

Bert Kimball wrote the following: "I have just returned from the funeral of our classmate, George Kennard Hooper. It was held in the Neighborhood Church, not very far from his home in Pasadena. You will be glad to know that four '91 men were present: Charles Garrison, Arthur H. Alley, Francis S. Viele, and myself, constituting a majority of our Southern California contingent.

"While I happened to be in town when your telegram was delivered yesterday, my wife was very helpful in making tentative arrangements for the wreath you asked me to have sent in the name of the Class. I was unable to get any answer to my call for Charlie Garrison, but when I telephoned my sister, she was able to tell me that he and Mrs. Garrison had gone to Pasadena. I felt sure then that he would find out about the funeral. Arthur Alley had come up to Los Angeles yesterday and learned from the evening paper of the passing of George. I suppose you know that Viele now lives in Palos Verdes, that attractive place just south of Redondo. When I telephoned him, he had already heard the sad news. He has seen considerable of George since he has moved here, and they spent an evening together quite recently.

"The clergyman at the funeral touched upon some of George's fine qualities, all of which we know so well. We lived quite near each other in Roxbury, Mass., before our Technology days, and I often think of the good influence he had upon the boys in the neighborhood. After graduation I saw but little of him until the World War, when we both were in Washington holding commissions in the Army. George was a major, while I was a captain, and it was my duty, whenever we met on the street, to initiate the salute, which was solemnly, yet cordially, returned. As I look back on George Hooper's life, I am still ready to salute him! He and Mrs. Hooper called here upon us soon after our arrival in California and, as ever, have been most kind and thoughtful."

Charlie Garrison also wrote soon after the funeral: "We came down to San Marino on January 25 to look after the children while Bob and Catherine went on a cruise to the West Indies. They return February 20, when we will retire to Santa Barbara. It was our sad duty to attend George Hooper's funeral. It was a shock when we got the telegram from Duncan, as we didn't know that he had

any illness. We went to the Unitarian Church. The Rev. Soares spoke with great feeling of his work both in the community and in the church. His intimate friends and classmates sat together as honorary pallbearers. Arthur Alley, Bert Kimball, Francis Viele, and other Tech men whom I didn't recognize were there. We talked with Viele and his wife who are living at Palos Verdes, and with Arthur Alley and his sister. I recalled the time when George and I were pallbearers for Arthur Shattuck.

"Next Tuesday we return to Santa Barbara just for the night to attend a concert of the Los Angeles Philharmonic Orchestra. Bob is due to arrive early Monday morning, February 20, and we will return to Santa Barbara in time to hear Josef Hofmann in a concert. Last year we heard him in Los Angeles 50 years after his first public performance in Boston. I heard him at the earlier period in Symphony Hall when he was only 11.

"Marg is well started in her work in Oakland and living in Berkeley. I had a letter from Ernest Hersam. He is driving to Mexico with friends, and from there he will take the train East to visit his nephew in Stoneham, I believe. So you may see him before his return. It will be a great thing for him to have this change now, as it is so hard for him to live alone in his rather inaccessible house. He has only this nephew left among his relations, and while he would like to have Ernest live with him in the East, I think that he will return to Berkeley. . . ."

Harry Young sent us a postal from Nassau where he spends some time in the winters. — Steve Bowen was in Bermuda part of the winter. — Fred Blanchard is home recuperating after his long siege at the hospital. He gets out some and hopes to be back on the job shortly.

Louis A. Simon has been in the architectural division of the Treasury Department in Washington, D.C., for many years. The following is from the New York Times: "Secretary Morgenthau announced today the retirement of Louis A. Simon, supervising architect of the public building branch of the Treasury Department. LeRoy Barton will succeed him, becoming acting supervising architect January 1. Mr. Simon retires because of reaching the legal limit of forty-two years' service, in which his advancement has been steady. His great interest, his friends say, has been in the development of an expressive Federal architecture. He took part in developing the Triangle Group of buildings and Grand Plaza here. . . ."

We have received advices that Charles Ricker is now located at the Cia Cubana de Electricidad, Post Office Box 1715, Havana, Cuba. — HENRY A. FISKE, Secretary, Grinnell Company, Inc., 260 West Exchange Street, Providence, R.I. BARNARD CAPEN, Assistant Secretary, Early Convalescent Home, Cohasset, Mass.

1893

The ice rink of the Skating Club of Boston, recently constructed in Boston between Soldiers Field Road and Western

Avenue, facing the Charles River, is the latest of four such rinks belonging to private skating clubs in the country, the others being in Chicago, Cleveland, and Philadelphia. The Boston rink was largely the work of M.I.T. Alumni. L. Gordon Glazier '11 was chairman of the building committee, and he engaged the all-Technology firm of Fay, Spofford and Thorndike (F. H. Fay '93, C. M. Spofford '93, and the late S. H. Thorndike '94) to design and supervise construction. Other M.I.T. graduates of Course I to take an important part in the engineering work were John Ayer '05, the member of the firm who was in charge of the construction; H. J. Williams '20; and F. R. Berman '36. Construction was begun on August 24, and on January 1 the skating facilities, dressing rooms, and baths were opened to members of the club and to the Harvard hockey team, which has quarters in the rink. Construction of the clubhouse at the end of the rink, facing Soldiers Field Road and the Charles River, will be carried out this spring as soon as weather conditions are favorable.

The membership of the Skating Club includes some of the country's finest skaters who now have available for the first time for their own use a skating surface 85 feet by 193 feet in a high, spacious auditorium with an attractive arched roof supported by two-hinged steel arches. The ice surface is formed on a concrete slab which in turn rests directly upon another concrete slab. The freezing pipes, closely spaced, are located in the top slab. The freezing is accomplished by the circulation of brine from equipment furnished by the Frick Company of Waynesboro, Pa., of which company Terry Mitchell '21 is advertising manager. The steel work of the rink was fabricated by the New England Structural Company, the president of which is Walter B. Douglass '91. — (G. B. G.)

The "pumpkin-shaped" spheroidal water storage tank of the town of Brookline, so far as is known the first of its kind to be built in the world, is another interesting and unusual project handled recently by Fay, Spofford and Thorndike. As the location is on slightly Single Tree Hill, the highest land in the Boston district except the Blue Hills, the usual type of standpipe was barred for esthetic reasons, and the problem was presented of providing the required storage in a tank of very low height. Its maximum diameter is 90 feet, its height 47 feet, and its storage capacity is 1,660,000 gallons. The top of the tank is 375 feet above sea level; thus adequate pressure will be furnished to any building in Brookline. At the top of the tank a police radio signal mast is to be installed. The tank is a welded steel structure requiring over 5,000 linear feet, or about one mile, of field welding. More than 200 pine trees, chosen because they remain green the year around, are to be planted around the base of the structure. For the present, until the trees grow to a height sufficient to mask the tank completely, its surface is to be painted a neutral shade in order that it may be relatively inconspicuous. — (G. B. G.)

You will find on page I information on Alumni Day, June 5

The following changes of address have been received: Clarence E. Fuller, 989 Columbus Avenue, Roxbury, Mass.; Edward B. Randall, 1533 Sutter Street, San Francisco, Calif. — FREDERIC H. FAY, *Secretary*, 11 Beacon Street, Boston, Mass. GEORGE B. GLIDDEN, *Assistant Secretary*, 551 Tremont Street, Boston, Mass.

1895

We learned from the Alumni Association of the sudden passing of Jimmy Humphreys at his home in Wilton, Conn., on February 16. It is with the deepest regret we are recording the sad news. James Humphreys, born at Dedham, Mass., in 1871, was associated with the Class during the years 1891 and 1892. He continued his affiliation with us from the time he left Technology to his death and, during his later years, was very active in all Tech affairs, especially so in Fairfield County, Conn. His cheery and amiable disposition contributed much to the good times enjoyed at our reunions. We shall miss him. In 1892 and 1893 he was associated with the General Electric Company at Lynn, Mass. From 1893 to 1898 he followed construction work with the New Haven Street Railway Company, New Haven, Conn., and with the Norwalk Street Railway Company, Norwalk, Conn., becoming electrical engineer of operations with the latter company. In 1898-1899 he was treasurer of Hadaway Electric Heating and Engineering Company, New York City. In 1900 he was affiliated with the Johns-Manville Company in Boston, as a department manager. Since 1928 he followed the heating and ventilating field of engineering and in his later years was interested in the insurance business. At the time of his death he was chairman of the Wilton Highway Safety Committee, also chairman of the financial committee of the Wilton Republican Club.

In 1907 he married Maud C. Smith, who now survives him. His social organizations included the Sigma Chi Fraternity, Alumni Association of the M.I.T., Faculty Club of M.I.T., Boston City Club, and Norfolk Golf Club, Dedham, Mass. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass. JOHN H. GARDINER, *Assistant Secretary*, Graybar Electric Company, 420 Lexington Avenue, New York, N.Y.

1896

Last month these notes mentioned the receipt by the Secretary of a typical newsy letter from Con Young in Florida. This is an annual event and signifies that winter is on the wane. Just at the time these notes are being dictated in Cambridge, toward the end of March, the view outside does not look much like spring, but since April is only a few days off we can feel assured that spring will soon be here. Con also sent a picture post card of a tarpon and referred to the fact that none had been caught since 1932 equal to the one which Con landed in that year and which he now claims to have weighed 125 pounds and to have measured six feet five inches in length.

Con explained also the acquisition of his new typewriter, which resulted from saving for three years Christmas checks which came to him and Abby from a dear elderly lady, supplemented by a birthday check from a loving niece and a special contribution by Abby, who reluctantly parted with an old, decrepit typewriter for a turn-in allowance. This was her own personal property. Con submits this story as evidence of the Scotch blood which he claims to run in his veins. His letter ran the gamut of business conditions, Federal policies, termites, and what not. He reported a welcome call on January 28 from Lloyd Wayne, who was spending a few days in Florida. He referred also to Clark Holbrook, who with Mrs. Holbrook spent the winter at Miami Beach and rode in the front seats of the social chariot there. He referred to the episode of our reunion at Osterville in 1931 when Woodwell had his airplane and supplied rides to classmates. It seems that at 3,000 feet of altitude Clark felt a little nervous, or at least made nervousness an excuse, and grabbed Abby's hand. However, Con has his doubts and thinks that this may have been just a back-seat habit which Clark had acquired.

Con also referred to vonHolst and his wife, who operate a subdivision near Boca Raton. They own 16 modern Spanish-type buildings there which they lease or sell. A year would not pass without a snake story, and Con tells of his battle with a large snake earlier in the fall. This was not a rattler but a flat-headed adder. Con is especially proud of his accomplishment, during the winter, of building a wall cupboard in the little apartment which he and Abby occupy. This had the effect of loosening up his muscles and creating a desire for a welcome shower several times a week. He was tired but happy when the job was finished. This winter this year has been a fine one in Florida, with no freezes, and at the time he wrote the beach near Fort Myers was crowded daily with bathers.

The Secretary has also received letters recently from Mark Allen in Detroit, Arthur Baldwin in Paris, Joe Clary in Washington, Eddie Mansfield in Winchester, Mass., and Lou Morse in York, Pa., but these letters did not contain any special items of interest. Mark Allen had nearly wrecked his house trying to locate some negatives of pictures which he took at our reunion in 1936, but before the house was completely demolished Mark's son Richard appeared and told Mark exactly where his father had put these negatives. — Clary reported that he had attended a recent meeting of the Washington Society of the M.I.T. and that Marshall Leighton and Nathan Grover of our Class were also present. Grover is now retired. Clary describes him as showing appearance of age, but actually this appearance belies him, as he is apparently in splendid physical condition at the age of 70. Eddie Mansfield has been in involuntary retirement for the past few years but is still the same peppy individual and is ready to take on any job that may be offered him.

Rockwell made his annual trip to his brother in Harriman, Tenn., in March and inspected the milling operations of the family there. The mill had recently suffered from a flood. On his way back Rockwell stopped at Franklin and Marshall College, Lancaster, Pa., for the meet for the national collegiate wrestling championship and for conferring with the other committee members of the Olympic wrestling committee for the meeting in Finland in 1940. Classmates, and especially Admiral Bakenhus, will be interested to learn of the improvement shown by the Technology fencing team, in which Bakenhus has taken a keen interest. Rockwell suggests that other classmates might follow Bakenhus' example of taking up fencing to reduce excess weight and keep in good physical condition. This thought is one which might possibly be considered by John Tilley, and Rockwell even thinks that Wayne might look into it now that he has become officially retired.

The Secretary had a nice little visit from Bradley Stoughton in January when Bradley came to Cambridge to attend the funeral services of Albert Sauveur '89. The two of us had lunch together that day. Bradley is scheduled for early retirement from Lehigh University where he is now holding the position of dean. — Mike Sturm has apparently been unable to secure detailed information regarding our classmate Floyd Frazier, whose death was reported last fall as having occurred on February 28, 1934. Frazier was with us for two years in Course IX and was a member of Sigma Alpha Epsilon Fraternity. He was born, October 30, 1873, in Aurora, Ill., the son of W. S. Frazier. He was married, October 30, 1895, to Maud Harris, and one son was born on July 17, 1899. Frazier was active with the Class as a student, and occasional communications were received from him after he left school, but for a few years past we have not had any address for him. Indications are that he was located much of the time in the vicinity of Chicago, as he was listed as a member of the South Shore Country Club and the Calumet Country Club, as well as being a member of the New York Athletic Club. His son Harris is living at 2519 Harrison Street, Evanston, Ill.

The December issue of *Telephone Topics*, published by the New England Telephone and Telegraph Company, contains a little article on Lambert N. Whitney who had retired after 42 years of service. He started with the Telephone Company in New York in 1896 and was successively located in Indianapolis, Chicago, and Cleveland before coming to Boston as general commercial superintendent in 1914. In 1923 he became general commercial manager and in 1929 assistant vice-president. The telephone business has been his life, and, while interested in Technology and the Class, he never seemed to be able to find time to go to any of our gatherings. Now that he is retired, we shall hope to see more of Jim Whitney. One of his friends reported to the Secretary that recently he saw Whitney on

1896 Continued

Boston Common, sitting there feeding the squirrels, so that Whitney seems now to be able to have time for his hobbies or to give scope to repressed desires for which he previously had no time. — The Secretary received a card from Sam Hunt in February. Sam was then in New Orleans, headed for Mexico with a party of young athletes in search of romance and adventure on foot, bus, and horse.

From Paul Litchfield in Akron has come to the Secretary a nice personal letter and printed material dealing with the recent celebration in Akron of the 40th anniversary of the incorporation of the Goodyear Company and the 100th anniversary of the discovery of vulcanization by Charles Goodyear. Many guests of high note were present. The whole affair was given much space in the local Akron papers and in the Goodyear *Triangle* — the organ of the Goodyear Company — and was apparently an epochal event. A bronze statue, the gift of Paul Litchfield to the city of Akron as a monument, was unveiled by Mrs. Nelson Goodyear, a granddaughter of the inventor. The city in return presented Paul with a walnut chest suitably inscribed as a memento of the occasion. Paul reports for himself that he made a trip to Sweden and another one to Brazil during the past year to buy properties and build tire plants in each of those countries. These plants are moving along rapidly, and at the time of the Akron celebration word was received that the Swedish plant had produced its first tire. The company now has nine factories producing tires outside of the United States. Incidentally Dr. Compton, who visited the Akron Club on March 20, reports that he was royally received there and that Litchfield got out the big Goodyear automobile used for occasions of state and also sent him up in the air on a blimp ride. In fact during the afternoon preceding the dinner Litchfield personally conducted Dr. Compton.

Again Will Coolidge wins a medal, this time the Faraday Medal for 1938, awarded him for notable scientific and industrial achievements in electrical engineering. This medal is presented annually by the council of the Institution of Electrical Engineers in England, and Dr. Coolidge is the second General Electric scientist to receive the award, the other being the late Professor Elihu Thomson.

Report can now be made on the little gathering of the New York crowd at the Engineers Club on February 14, when the Secretary was in New York. It turned out that the date was a little disastrous, in that Jim Melliush and Steve Crane were not very well, Ruckgaber was in Europe, Ed Sturtevant was called out of town on business, Andrew had to go to Detroit, Freedman had a previous engagement, Starr was in Florida for the winter, Charlie Lawrence was up in Baldwinville, N.Y., and even Admiral Bakenhus himself was away off in Venezuela. Rutherford also was unable to get to the meeting. Four other men, Allen, Charles Hall, Lynch, and McElroy, who are located around New York, did not reply to the invitation. The result was that it

was a small but very select group that sat down to the dinner, consisting of Trout, Sager, Tilley, Gaylord Hall, and the Secretary, with a notable guest in the person of Dan Webster, whom Tilley introduced as his boss, and who added still further zest to the occasion. Notes of greetings were read from Lawrence and from Rutherford, and a real message from Bakenhus written at the Caracas Country Club in Caracas, Venezuela. He reported that he was having a fine trip and was finding the country very enjoyable, with a glorious climate at Caracas. He was impressed with various possibilities for development. He had run across several Tech men, both native Venezuelans and Americans, and one young native sanitary engineer who was proud to have studied under Charlie Hyde. The meeting held on with discussion of this and that until a fairly late hour, when Charlie Trout had to leave to catch the Staten Island ferry, in order to be home to get up at 6:00 A.M. to attend to one or another of his three remaining jobs, and Hall had to retire in order to get his horsecar out in the morning. Tilley, however, did not feel that the evening was finished and therefore insisted on a little tour to Greenwich Village, which proved to be very enjoyable to the other two members of his party, Sager and Locke. Sager was finally delivered at the West Shore station to commute home. Tilley delivered Locke at the Hotel Commodore, then he wended his way to Flushing. Thus ended another annual gathering of the New York crowd which year by year becomes of increased significance and attraction.

Classmates will be interested to hear that a grateful acknowledgment has been received from the Advisory Council on Athletics at M.I.T. for the contribution of \$50 made by the Class again this year for athletics, just the same as in past years. — Don't forget Alumni Day, June 5! — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

1897

William H. Sellw, II, died in Ann Arbor, Mich., on January 29 after a brief illness. Mr. Sellw had an international reputation in the field of railroad engineering and research work related thereto. After graduation his first work was as assistant engineer with the Pennsylvania Railroad. Later he became associated with the New York Central lines as division engineer with headquarters at Detroit. He constructed the second belt line which now serves the major industrial area in Detroit. After 27 years in active railroad service he resigned and gave his entire time to research and development work in the field of solution cycles. Among resulting developments may be mentioned large central electric generating plants, locomotive and industrial power plants, plants for the recovery of waste heat in paper mills and chemical works. Particularly was he interested in the development of more efficient refrigerating systems for air-conditioning units.

In 1927 he was appointed assistant director of research in the department of engineering research at the University of Michigan, which position he held until 1933. He was the author of two outstanding books in railroad engineering, "Steel Rails" and "Railroad Maintenance," and he was a frequent contributor to the columns of engineering periodicals.

He was a member of the Society of Military Engineers, the American Society of Mechanical Engineers, and a fellow of the American Society for the Advancement of Science. He leaves his widow, Mrs. Helen Walsh Sellw; a daughter, Mrs. G. Thomas McKean of Detroit; and a sister, Miss Gladys Sellw of Washington, D.C.

You will be interested to know that following more than 30 years of service on the engineering staff of the National Board of Fire Underwriters, John H. Howland retired on December 31, with a suitable pension, to live on his recently purchased country place at New London, N.H. At a luncheon attended by Chief Engineer George W. Booth and some 30 members of the National Board staff, as reported in the New York *Journal of Commerce*, "Major Howland was given a handsome ship's clock and barometer. In the presentation General Manager W. E. Mallalieu lauded the major for his loyalty and devotion to the National Board and above all for his readiness at all times to lend a hand to others. Mrs. Howland, who also attended the luncheon, received a bouquet of 30 American Beauty roses.

"Major Howland, a Massachusetts Yankee of whaling ancestry, started his engineering training in the New Bedford water department, after which he went to Boston. Here he worked with several of the foremost hydraulic and mechanical engineers and completed the civil engineering course at the Massachusetts Institute of Technology, with the class of 1897. After two years of post graduate work in and around Boston, he journeyed to the Hawaiian Islands where he became territorial superintendent of public works and superintendent of the Honolulu water works. In 1907, he returned to the States, was superintendent of construction on hydro-electric work for nearly a year and became associated with the National Board in 1908. Major Howland, in his surveys of the water systems in cities all over the United States, has become known as one of the nation's foremost authorities in this work. He received his commission as Major during the World War and worked out of the Quartermaster General's office in Washington." — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass. CHARLES W. BRADLEE, *Acting Secretary*, 30 Kilby Street, Boston, Mass.

1899

Reunion: Arthur L. Hamilton, Class President, Hotel Somerset, Boston, has accepted the chairmanship of a committee to arrange the details of our 40th reunion. He is being ably assisted by Arthur Brown, 53 State Street, Boston; Miles Sherrill, Room 4-463, M.I.T.; and Wil-

You will find on page 1 information on Alumni Day, June 5

1899 Continued

liam A. Kinsman, 348 High Street, Newburyport, Mass. The committee has chosen the Essex County Club near Boston as the place for our 40th reunion on June 3, 4, and 5. Festivities will open with a dinner on Saturday night, June 3, at the club. Make your plans to arrive in time for it. This will be a *stag* reunion. We have engaged all the rooms available at the club. Should more be required there is space in near-by hotels. There will be cars enough to transport members who do not have their own cars with them. Be sure and return the self-addressed post card to Arthur Brown, so your reservations can be taken care of properly.

A few bits of news have come my way in the last month. Ben Morse, writing from Melbourne Beach, Fla., told me of his Nova Scotian home at Clementsport, which sounds like an enchanting community where people get a living from fishing and farming. There are no large cities near, and he has the only sandy bathing beach on the Annapolis Basin. He has plenty of company because people go there from miles around to swim. — Edwin F. Samuels of Baltimore intends to go to the reunion and wrote me recently of his acquaintance with two Naval Academy boys, one of whom turned out to be the grandson of Professor Whitaker of M.I.T. and the son of Lambert of the Class of '97. Stewart visited Lambert in Tyngsboro, Mass., recently and renewed his acquaintance. Lambert has four sons; two are navy lieutenants and one is a coast guard lieutenant. — Lew Emery, I learned through Hamilton, has been ill for some months at Atlantic City, N.J., but is hoping to be able to attend the reunion. — Newell of the Bath Iron Works plans to attend the reunion, as do some 30 or more others with whom members of the committee have corresponded.

I have learned with regret of the death of Herbert Riddle on February 28, at his residence on Woodlawn Avenue, Chicago, Ill. Funeral services were held for him in the Graham Taylor Chapel at the Chicago Theological Seminary. He was the architect for the seminary group of buildings on the University of Chicago campus. He also designed the Mather Tower, the Children's Home and Aid Society Building in Evanston, the First Baptist Church of Chicago, the North Shore Methodist Church in Glencoe, and numerous other buildings in the Chicago district. His architectural library was known as one of the finest private collections. — W. MALCOLM CORSE, *Secretary*, 1901 Wyoming Avenue, Northwest, Washington, D.C. ARTHUR H. BROWN, *Assistant Secretary*, 53 State Street, Boston, Mass.

1900

It is encouraging to note the continued attendance at the meetings of the Alumni Council of the members of this Class. Among the steadies are Charlie Smith, Ziegler, Allen, Draper, Fitch, and Russell. — Robert H. Leach, Fairfield, Conn., has been awarded patents No. 2,138,637 and No. 2,138,638 on production of an alloy of silver, copper, manga-

nese, zinc, nickel, and silicon. — As the time approaches for our 1940 reunion it behooves us to start making plans for it.

When you come for the 1939 Alumni Day, June 5, have all your suggestions in mind. Those not planning to attend should write their ideas, so that we can get off to a flying start. — Just keep in mind that 40 is quite a span and that it is going to take a lot of time and work to get the gang together. The sooner we get started, the larger will be the crowd. — C. BURTON COTTING, *Secretary*, 111 Devonshire Street, Boston, Mass

1903

Frank B. Jewett, VI, Vice-President in Charge of Development and Research of the American Telephone and Telegraph Company and President of Bell Telephone Laboratories, has been nominated for president of the Alumni Association for next year. — John Ancona, II, construction engineer in Rochester, N.Y., has been nominated for representative-at-large on the Executive Committee. Ancona has been an honorary secretary for several years. — After returning from his trip to England, Joyce, V, was transferred from the Doyle works of the Du Pont Company in Leominster, Mass., to the Arlington, N.J., works. His comment on the political situation in England is interesting, and we quote from his letter of January 27: "The criticism I have heard, since my return, of Chamberlain's cowardice in not calling Hitler's bluff last September makes me a little tired. It isn't so easy to be brave when your home is less than an hour's run from Cologne in a bombing plane. The menace of an air attack to people in England was very real. I was there during one practice black-out and didn't like the sensation. The teachers in the schools were busy fitting gas masks to children and that in no holiday spirit either. There was a very real fear that an air attack might have occurred soon after the 25th if Chamberlain had failed in his mission."

There are too many names of '03 men in the "missing" column, and in spite of having received no help on any names previously listed, we are going to give you those of Courses V, VI, IX, and XIII herewith, with the hope that someone will tell us about them. No addresses are known for H. H. Dillon, VI; F. H. Lacey, V; R. D. Morris, VI; C. J. Smith, VI, last known in Glendale, Calif.; F. H. Wetherald, VI; O. L. Roehr, XIII; and William Winter, IX. Please help your Secretaries and the Alumni Office, if you know anything about these men.

We shall need some news for our next issue. Don't forget — if you want something under '03, it is up to you to write us once in a while. — FREDERIC A. EUSTIS, *Secretary*, 131 State Street, Boston, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, 441 Stuart Street, Boston, Mass.

1907

As the result of earnest correspondence we received a welcome word in February from Llewellyn D. Davenport, I. From 1907 to 1920 he was with the Oliver Iron

Mining Company (United States Steel) in Chisholm and Hibbing, Minn., successively as engineer, shift boss, night foreman in open pit, assistant chief engineer, and chief engineer. He had charge of moving the town of Hibbing about one and a half miles to allow mining the town site for iron. From 1921 to 1924 he was consulting engineer for the South Manchuria Railway Company, spending 28 months in Manchuria and making a detailed 20-year mining plan for the largest coal mine in the world at Fushun, South Manchuria, the fields containing some eight hundred million tons of coal. After his return to the United States he practiced privately as a consulting engineer in Santa Barbara, Calif., until 1935, and since then has been resident engineer of various jobs for Quinton, Code and Hill — Leeds and Barnard of Los Angeles. L. D. and his wife live at Hope Ranch, Santa Barbara, and he says his favorite amusement is jogging along a trail on a cow pony. He has no children.

In a fine long letter received in March from Ralph Crosby, he tells of his interesting family. His oldest daughter is now Mrs. John L. Thomas and has three girls, aged five, three, and one and a half years. The next oldest daughter is married to R. Lawrence Thomas, a brother of John L. Thomas, and has two girls, aged three and one and a half years. The third daughter, Christine, is single. The fourth, Ruth, was married last November to Edward J. Blum. She is a graduate of Michael Reese Hospital Nurses Training School and is still working. Ralph's fifth child, Edwin S., is a senior at North Central College in Naperville, Ill., majoring in zoölogy and chemistry and expecting to make ichthyology his lifework. The two youngest children, Phoebe and Mary, are junior and sophomore respectively in high school. So with a wife, seven children, three sons-in-law, and five granddaughters, Ralph has an immediate family of 17. Our congratulations! So far as we know, no other '07 man can equal that record. In a business way, things have not been so good in recent years. Doing well as the proprietor of a service station, beginning in 1933, his business was greatly decreased by the closing of the main road past the station about a year and a half ago, so that when his lease expired last September he did not renew it. He hopes for an engineering connection soon. Ralph's address is 421 West Ash Street, Lombard, Ill. He writes of attending the M.I.T. Chicago Club dinner on March 2 and of seeing Andy Rebori, Sam Marx, Les Whittemore, John Frank, and Jim Barker.

From 1912 to 1914 Crosby was assistant supervisor with the Isthmian Canal Commission and while thus connected he was responsible for Phil Greenwood's becoming an inspector with the Panama Canal, in which grade he continued until 1920, when he became chief inspector. In Ralph's recent letter he says that Phil made a trip to the Isthmus on business during last February. Phil is married, has a son 22 years old and a daughter nearly 24. The family home is at 8 Barney

1907 Continued

Street, Brentwood, Md., and his office is at Room 1307, Munitions Building, Washington, D.C.

At the request of B. C. Gupta, whose letter appeared in the April Review, we sent copies of it to nine of our classmates, one of whom was Hugh Pastoriza. In acknowledging receipt of this Hugh wrote as follows: "As you surmise, I am still in the public utility security business with Coffin and Burr, Inc. The refunding of utility bond issues with new ones of lower coupon rate has been very frequent in the last three years, and I have examined and studied many of the important companies in the industry in connection with our underwritings. I ran into Alex Macomber for the first time since graduation when we examined one utility property together some three years ago. I have seen John McMillin several times in connection with the utilities of Cities Service. Merton Sage was my neighbor in Brooklyn right after the War, and we moved our families to Bronxville at the same time. I married shortly after returning from France and getting out of the Army, and now have four sons and a daughter. The eldest boy is a candidate for Tech next fall." — Hugh's business connection has been with Coffin and Burr since 1915, prior to which he was with Telluride Power Company, Stone and Webster Engineering Corporation, and Electric Bond and Share Company. His children range in age from 18 years to nearly nine years, the youngest being twins born in 1930. The family home is at 10 Oriole Avenue, Bronxville, N.Y., and his office is at Room 5107, 70 Pine Street, New York City.

Another to acknowledge the copy of Gupta's letter was Lester Brock, who wrote on February 26 on the letterhead of the C. P. Hall Company, chemical manufacturers, of Akron, Ohio, with which firm Lester is a salesman. He wrote from the Hotel Robert Treat in Newark, N.J., where he was spending a rainy Sunday. It was a fine cordial letter but added nothing to our knowledge of his doings or family, regarding which we gave the facts in *The Review* of July, 1937.

In the Boston *Herald* of February 27 appeared an announcement of the engagement of Eunice Robinson, daughter of Winslow D. Robinson, to Harold D. Hastings of Syracuse, N.Y. Eunice attended Lasell Junior College at Auburndale, Mass., and took several courses at Tech. She is now affiliated with the New England Museum of Natural History, in Boston, where she is an assistant to the curator of geology and mineralogy. — Through the courtesy of Orville Denison '11 we have a clipping from the Worcester, Mass., *Evening Gazette* of March 3, telling of the organization of the first industry-sponsored Boy Scout troop in the Worcester Area Council at the factory of Allen-Squire Company, shoe manufacturers of Spencer, Mass. The troop committee of this new unit is composed of employees of the concern, and members must be relatives of employees. Charlie Allen and Ed Squire are the owners of this business, and Boyd Allen,

Charlie's son, is scoutmaster of this new troop. Sponsorship of this kind fills a need in a section where no church or other organization is available for sponsorship.

O. L. Peabody is now president of a new company, Waverly Boston Company, makers of lubricating oils and greases, located at 34 Midway Street, Boston. On February 20 Peabo wrote: "I left the Boston Filter Company, Carrier agents, last fall. We formed this small company to take the agency for Waverly Oil. Another man and myself are the whole company, a sort of South American army; in fact we had to include my wife to have enough to incorporate. It is of necessity a small venture but it gives me something to do, and if it goes along all right we may make a living out of it."

In closing, let me urge your attendance at Cambridge and Boston on Alumni Day, June 5. There will be no special private gathering of '07 men, but at the noon luncheon and afternoon exercises at Cambridge, and at the evening banquet at Boston, ample opportunity will be afforded for fellowship with your classmates. Be sure to reserve your tickets in advance. — BRYANT NICHOLS, *Secretary*, 126 Charles Street, Auburndale, Mass. HAROLD S. WONSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

1909

Thirtieth reunion, Oyster Harbors Club, June 3 to 5. — The Class owes a debt of gratitude to its efficient Assistant Secretary, Paul Wiswall, for his efforts in arranging for the fall and spring luncheons of the Class, held each year in New York City. Recently Paul wrote: "In the new Tech Club quarters in the Williams Club building, we had our spring luncheon on March 4 with 18 of our classmates present. Phil Chase delegated to his staff the job of supplying Philadelphia with light and power and, for the first time as far as I can remember, sat with us. I hope he comes again. Edwin S. Burdell '20, XV, now director of Cooper Union, accepted our invitation to lunch with us. The speaker was Robert M. Kimball '33, XV, assistant director of admissions, who made me feel pretty middle-aged when he told us that when we were getting our diplomas, he was just a twinkle in his father's eye. In my job as honorary secretary I get many letters from Bob. Yet more than ever was I impressed with the fact that we have an excellent assistant director in Bob, and I think all the other men, most of whom did not know him, had the same feeling.

"George Gray told me about Charlie Belden's being in the East, lecturing. George was hoping he might get Charlie and have him come to the lunch, but the latter's schedule did not bring him here in time. Here are some notices about Charlie, who showed pictures of the 'land where the West remains' as a part of a lecture, 'Life on the Range,' given at the George Inness School in Montclair, N.J., on March 20. Charlie is a genuine ranchman, owning 200,000 acres at Pitchfork,

Wyo. His camera has traveled 60,000 miles on horseback and has recorded every conceivable phase of the life of the cowboy as well as scenes of rodeo. In Wyoming, Charlie is called the 'Antelope King' because one-eighth of the 40,000 pronghorn in the United States roam over his huge ranch. The antelope a few years ago were nearing extinction, but as a result of this protection they have multiplied tremendously. Belden is a remarkable photographer of animals in action, many of the striking pictures of cattle and horses of the West used by the *National Geographic Magazine* having been taken by him."

Admiral Ellis is moving to larger quarters in the Woolworth Building — from which one infers that patents are on the up-and-up. — Molly Scharff is also moving his New York office, the new address being 285 Madison Avenue. — Anthony G. de Golyer has been awarded six patents on alloys of various metals characterized by high resistance to deformation and abrasion.

From Chicago our Assistant Secretary, George Wallis, writes: "At the second annual dinner of the Technology Club of Chicago for Dr. Karl Taylor Compton, held at the Lake Shore Athletic Club, our Class was represented by two others besides the writer, namely, Harvey S. Pardee and John R. Baldwin. John is a new member in our midst, having come to Chicago about a year ago. He is now located at the headquarters of the Republic Flow Meters Company of Chicago, and since joining this company in 1919 he has been associated with their various branches, including those at Cleveland and Philadelphia. John tells me that he has one boy 12 years old who is attending the public school in Evanston. Ed Ryerson sent his regrets 'due to the fact that he would be away on a two weeks' trip to California.' Harvey Pardee tells me that his oldest daughter is still in school at Oxford, England, and his youngest daughter is now attending the University of North Carolina. Harvey is still busy inventing and developing new projects. His laboratory is located on the near west side of Chicago."

A few days after the receipt of George's letter I received word of the death of John C. Bollenbacher, through the courtesy of Lonsdale Green '87 of Chicago, who writes: "I was surprised and shocked to read this (press notice inclosed) in the morning paper, for I did not know that he was sick and this came to me very unexpectedly. At our annual banquet last Thursday there were many absentees, mainly on account of flu and other seasonal ailments, so while I missed him then I thought nothing of it. I liked J. C., for he had a fine personality and never was of the sort to high-hat anybody. Ten years ago when he was the partner of Alfred Granger '89, he lived here in Hyde Park and was a neighbor. I often met him and his wife and his children who were at that time mere babies. So being neighbors made another bond of friendship, for I had often met him at our various Tech meetings and

You will find on page 1 information on Alumni Day, June 5

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luncheons. He was of the sort that by his loyalty kept up the *esprit de corps* of the local Alumni. Physically he did not seem to have a strong frame or any surplus of flesh on his bones. Possibly if he had any business cares or worry, it would affect his health. But he was young and we can ill afford to lose such men, for he went just at a time that he should have been in his prime."

From 1934 to 1936 Bollenbacher was a consulting architect in the Treasury Department at Washington. Among the better known buildings he constructed were the Chicago Club and Cloisters Apartment Building, the medical and dental college buildings of the University of Illinois in Chicago, the Winnebago County Courthouse at Oshkosh, Wis., and the Union Building, Women's Memorial Residence Hall, and the Administration Building of Indiana University. Bollenbacher was a member of the firm of Granger and Bollenbacher. He was a fellow of the American Institute of Architects and a former president of the Chicago chapter. Surviving are his widow, Pauline Reed Bollenbacher; a son, John C., Jr.; and a daughter, Paula.

Congratulations are in order for J. Newell Stephenson, who has been awarded the Gold Medal of the Technical Association of the Pulp and Paper Industry for 1939 in recognition of his outstanding contribution to the technical development of the industry through the publication of a five-volume edition of textbooks on the manufacture of pulp and paper. George Carruthers, President of the Interlake Tissue Mills Company, Ltd., and chairman of the Joint Textbook Committee of the Paper Industry of the United States and Canada, in presenting the medal to Steve, said in part: "May I be permitted to say that we of the Joint Textbook Committee know, as few others can know, the amount of hard work, tact, and sound judgment which Mr. Stephenson has applied to this work with the result that we have one of the finest series of industrial texts in existence. We have always placed high value on Mr. Stephenson's services to the industry, and it was with great satisfaction that we learned that T.A.P.P.I. had decided to acknowledge his services formally by awarding to him their 1939 medal, a satisfaction which, I am sure, is shared by all technically informed men in the pulp and paper industry of this continent." — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. *Assistant Secretaries*: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

1910

Your Secretary had a letter from Charles A. Robb, stating that the degree of doctor of engineering had been conferred upon him by Johns Hopkins University at Baltimore, June 14. The subject of his dissertation was "Recompression Phenomena in Steam Nozzles." The research was carried out under the direction of Professor A. G. Christir. This is the first communication the Class has had from

Robb in many years, and it is hoped that we may hear more from him in the near future. Aside from this honor which has been conferred upon him, it is assumed that he has charge of the mechanical engineering department at the University of Alberta, Edmonton, Canada.

Phil Taylor, who lives in Wellesley, Mass., serves as a member of the town meeting and as a member of the planning board. — HERBERT S. CLEVERDON, *Secretary*, 46 Cornhill, Boston, Mass.

1911

Fate struck a cruel blow in mid-March, snuffing out the life of our popular classmate, Charlie Barker, VI, and critically injuring his wife, Mary, in an automobile accident in California. Charlie and his wife left Berkeley — where Charlie was president of the B. F. Sturtevant Company of California — for a business trip to Stockton on March 15. According to the State Highway Patrol report, a car driven by a Pittsburg woman skidded and crashed into the Barker machine, overturning it and pinning Charlie and his wife beneath it. The woman driving the other car died instantly, and the Barkers were removed to Concord Hospital where Charlie died about seven hours later. At this late March writing Mary is still in a critical condition with slim chance of recovery. Charlie leaves two sons, Charles, 12, and Thomas, nine; his mother, Mrs. R. P. Barker; one sister, Mrs. L. A. Russ; and a brother, Richard. The latter three reside in Dorchester, Mass.

Charlie and I were together almost constantly through our Tech career, did our thesis together, then lived together for four or five years here in Worcester, and he was best man at my wedding. Two years ago he made a hurried trip East to see his family and stopped here to see us. He was the same old Charlie — philosophic, droll, witty. In fact, just two days before the tragedy I had a letter from him in which he said: "We are all fine here now that I fooled 'em again when they wanted to bury me with pneumonia — only the good die young." — Our hearts go out to his survivors and our prayers fervently ask that Mary's life be spared that she may continue her fine career of motherhood with her two sons, of whom Charlie was so fond and proud.

Had a nice note earlier in the month from Bunnie Wilson, XIV, Vice-President of the Aluminum Company of America, 801 Gulf Building, Pittsburgh, Pa., in which he inclosed a copy of the February bulletin of the New Jersey Taxpayers Association of which Don Stevens, II, is president. "It seems that I am rather limited to being a monger of news of Don," writes Bunnie, "as I cannot think of anything in regard to my own activities which would be of interest to you or any of our classmates. I manage to keep consistently healthy, happy, and busy, and believe you will agree that that covers a lot these days." — It sure does, Bunnie! It's *the* formula of life.

At the 1939 annual convention of the New Jersey State League of Municipalities, Don Stevens spoke as president of

the Taxpayers Association and quoting from Lewis Carroll those famous two verses starting "The time has come," the Walrus said," Don continued in part: "We are about to enter the Wonderland of Taxation. Our subject is 'Possibilities of Reducing the Tax Burden on Real Property.' Six years ago it was Governor A. Harry Moore (in a former term of office) who started me off upon this tax work, which I have followed so faithfully ever since in municipality, county and state. He advised a realtors convention that if they would have reduction of the tax burden they must inspire the people to take a greater interest in their cost of government, and that the most practical means of so doing would be through the organization of taxpayer associations. Almost instantly thereafter the realtors of my home town of Ridgewood, New Jersey, decided to organize an association and they came to me (not a realtor but a factory manager) to lead the movement.

"Fundamentally, we must not forget that after all the *owner* of real property is more important than the real property itself. If by relieving the tax upon real property we increase the tax burden upon the *owner* of real property, we have made no gain. On the contrary we have made a loss. Can anything be done to stop Increasing This Tax Burden? . . . Real estate taxes are high because real estate owners crave service. . . . Today matters are worse than usual because our whole nation is intent upon a governmental spending program. . . . The dollar can travel either into productive earnings or into government bureaucracy and much of the government bureaucracy is still at home and not all at Washington, notwithstanding the disastrous pace of the Federal Administration.

"In our lifetime and before, real estate has practically always carried the load that it has. For local units alone, I have authority for stating that general property tax accounted for 93% of all local revenues in 1913 as well as in 1930. . . . It is perhaps a surprise to realize that our *percentage* of taxation in 1930 is not far in excess of what it was in 1913. . . . The property owner wants monetary reduction like the very dickens and . . . he does not want to give up one single detail of municipal service. On the contrary he wants more service. Hence the constant effort to shift the tax somewhere else. . . .

"A sales tax or a new personal tax might relieve real estate 5% — possibly a little more — but it will burden the same individual taxpayer 15% or 20% — and a \$50,000,000 permanently expensive Mort Plan or Medical Aid Plan, or God knows what plan, will ride in on its coat tails. . . . Heed not the siren songs of those who would 'Broaden the base,' or those who would have 'tax limitation,' or those who offer other panaceas. . . .

"The picture really tempts one to stop all the racketeering for new tax programs by plumping for the single tax — a tax on land only. But this too — while a step in a safer direction than multiplica-

1911 Continued

tion of taxes — is probably unsound or it would have a stronger grip on the world than it has. At least let us go in for standing pat or reducing the number of taxes we now have. The real estate owner will prosper in the end. Tax limitation has proved disastrous. It is too big a subject here. The only tax limitation scheme that is safe is the refusal to stand for new forms of taxation.

... Many people seek an adjustment of their tax assessment and then next week they are demanding a new high school. New tax exemption can certainly be stopped and the old largely wiped out, but it will take real will-power to do it. ... Relief *must* be made less easy — both for unemployment and categorical or welfare classifications. ...

"Here is a mighty good program — that of the New Jersey State Chamber of Commerce: 'First, we must insist that no new indebtedness be incurred by public officials — municipal, county or State — except upon the most conclusive proof of the need existing for the proposed improvements. Second, we should demand that reduced debt service appropriations be translated into a lower tax rate rather than into increased operating expenditures, i.e., increased public payrolls. Third, we should watch the declining debt service appropriation in the State budget (including the Highway Department), and insist that the Legislature so use the growing annual balances resulting therefrom in a way that is most likely to help reduce the present heavy tax burden on the New Jersey property owner.'

"Next comes the drudgery of the taxpayer movement. All local and county expenditures should be audited or inspected as nearly daily as possible. If the local taxpayer associations cannot carry out this work because of lack of financial resources or time off from business, or the matured judgment necessary to do the work properly, I feel they should ask for the coöperation of the Chamber of Commerce chain. Such a system of inspection can be used for excellent publicity and educational work in the press. If this system is well established, then the local taxpayer movements can be depended upon to throw in their influence with the local Chamber of Commerce and so remove the curse that only the 'Capitalists' are behind the economy movement. The Taxpayer Associations can continue their annual study of budgets and their year around pressure upon local, county and state office-holders to work economically for the people. And finally the Chamber of Commerce and the Taxpayer Association can go along hand in hand in a very useful and mutually important endeavour."

"Think of your realtor," Don continued; "he does not care how real estate is relieved but he hopes that somehow ... he can get some real estate relief. New Jersey is now a standpat state with a simple tax structure. Don't tamper. Keep New Jersey and its units improving along ideas of debt reduction and economy in government and no new forms of taxation. ..."

Charlie McManus, I, civil engineer with the Massachusetts Department of Public Works, went for a 12-day West Indies cruise out of New York on the United Fruit liner *Munango*, touching Nassau, Miami, and Havana, with three days in the Cuban city as the high light of the trip, he told me when he dropped in to see me one day in early March. He has twin nephews, Tom and Ed McManus of Kingston, N.Y., who are sophomores at Holy Cross College here in Worcester. Another bit of local comment: Fred Daniels, VI, was elected president of the Worcester Club, outstanding local men's organization, at the late February annual meeting this year.

Fine work by junior elevens: John I. Herlihy, M.I.T. senior, was elected to Tau Beta Pi, engineering honorary fraternity comparable to Phi Beta Kappa in the liberal arts colleges; Orville B. Denison, Jr., Bowdoin sophomore, won the \$15 prize for the best individual acting in Bowdoin's 1939 annual one-act prize playwriting contest.

For lo these many years, I hadn't heard from Jack Woodruff, X, and learning his new address from the Alumni Office I dropped him a line and was rewarded with a fine letter which said: "It was nice to receive your letter and nicer still to know that you would like a peep from me. New York addresses are confusing these days and 445 West 23d Street (which you thought was a business address) marks the spot where I am cliff-dwelling and whence, reversing the usual procedure, I commute to the country, i.e., Rahway, N.J., where since the fall of '35 I have been very happily located in the research department of this, as you know, exceptionally fine company — Merck and Company, Inc. M.I.T. is well represented throughout the Merck organization but no others from 1911, all being of more recent vintage. Lloyd Cooley gave us the pleasure of a visit last summer, and I hope that when you are next in this neighborhood you can make an opportunity to drop in. I am not a member of the Williams Club, but my oldest boy, who is, tells me that the marriage of convenience with the Technology Club of New York brought on by the depression is working out beautifully and that all the Williams-ites think the Tech men are a swell bunch." — It's great to hear you are back in good health, Jack, and best of luck for much success in your work as assistant director of research and development for Merck.

An address change came through for Francis A. Moore, II, advising that he had transferred from Dallas to Tyler, Texas. There he is associated with the Sledge Manufacturing Company, which Thomas' "Register of Manufacturers" lists as an affiliate of the Moore Grocery Company, manufacturing workmen's clothing, overalls, and so on. We also finally located George Garnsey, V. He is back in his native Gloversville, N.Y., living at the Y.M.C.A. Other new addresses show that Bob Wood, VIII, has transferred from Rochester, N.Y., to 108 Bellevue Avenue,

Montclair, N.J.; that Earl R. Brown, II, is now at 6 North Victoria Avenue, Ventnor, N.J.; and that George Upton, I, is at 74 Washington Square, Salem, Mass.

Please plan to attend Alumni Day at the Institute, Monday, June 5, if you possibly can, and bring along other classmates or other Tech men. See you there. If you can't come, *write* to Dennie! — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

1912

Announcement of the wedding of Miss Louise Allinger to Albert Laurence Pashek, VI, of Lakewood, Ohio, has just come to hand. Returned from a wedding trip, they are residing at 1473 Alameda Avenue, Lakewood, Ohio. — Newton Davis, I, was killed in an airplane accident several years ago. — Eddie Upham, XIV, has been transferred to Montreal, where he may be reached at the Dominion Rubber Company, Post Office Box 330. — Henry A. Johnson, II, is now back in Washington, D.C., with the United States Public Health Service.

It seems rather useless to ask again for contributions of notes of interest. We are still hoping, however, that some of you will weaken and send them in. — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown, Mass. DAVID J. McGRATH, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 330 West 42d Street, New York, N. Y.

1914

Ross Dickson has done such a good job with his *Fourteen Pointer* that there is no additional data that can be given here regarding our 25th reunion next month. A fine attendance is in prospect, and if any classmate reading these notes has not been receiving the reunion notices, please write the Secretary at once.

Through the local press we learned that Roy Hardy has been reelected for another term as selectman at Andover, Mass. Our classmates seem altogether too modest in letting us know about their ventures into public service, and only by accident does your Secretary learn about these activities. Engineers are often accused of not being willing to do their part in public service matters. Facts do not bear this out, but perhaps because they are not selling securities, legal services, or are not engaged in similar occupations, they do not let their public works be known to their associates. Fourteen men are much interested in what their classmates are doing; so write and tell your Secretary about these activities.

Buck Dorrance and George Whitwell were in Cambridge on March 8 to attend the Technology Corporation meeting. This provided an opportunity for going over a number of reunion matters. Unfortunately these notes must be written before Charlie Fiske's New York dinner, held April 6. Based on past experience a grand time is assured, and undoubtedly a lot of enthusiasm will be inspired for the June reunion.

You will find on page I information on Alumni Day, June 5

1914 Continued

It has just been learned that Howard Wilkins has been ill with pneumonia, but he is now making good progress toward recovery. Numerous other classmates have been ill during the winter, largely from the gripe epidemic which has been going the rounds. Clear salt air at the New Ocean House, Swampscott, June 3 and 4, will be just the thing to restore health. — H. B. RICHMOND, *Secretary*, General Radio Company, 30 State Street, Cambridge, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York, N.Y.

1915

Here it is! You are all invited with your guests, male and female, to the class cocktail party at the Statler Hotel, Boston, Monday afternoon, June 5, from four to seven o'clock. This is entirely free — no speeches, no contributions — just a good time for all. So everyone come.

What an evening! Such fun! What an entertainment! On March 2 at Walker Memorial we set a new high in attendance: 34 for our class dinner — 30 classmates and four guests. Fred W. Barkley and Art Gerald as guests of Bill Brackett, Al Wechsler '21 by Class and '15 by adoption, and Ralph M. Howlett, my guest, added pleasantly to the following '15 men: Marshall Dalton, Easty Weaver, Herb Swift, Bert Adams, Weare Howlett, Carl Wood, John Hyneman, Wally Pike, Seward Highley, Louie Young, Archie Morrison, Reggie Foster, Larry Landers, Ben Hurvitz, Chet Runels, Clarence Hansen, Whit Brown, Frank Herlihy, Harold Colby, Frank Murphy, Johanus Hancock O'Brien, George Pirate Rooney, Bill Brackett, Abe Hamburg, Max Woythaler, Jac Sindler, Tom Tolar, Bob Warren, Fanny Freeman, and Azel Mack. A splendid showing indeed! Making their first appearance since graduation John Hyneman, I, and Clarence Hansen, V, received a warm welcome and were urged to come again. Other men we had not seen for a long time but whom we most assuredly were glad to see again were Fanny Freeman and Seward Highley. Long-distance honors went to Whit Brown from Concord, Mass.; Reg Foster and Chet Runels, the Lowell twins; and, of course, irrepressible Speed Swift from New London, N.H., and points north.

As usual our Class dispensed with formality and seriousness but following one of the enjoyable dinners of Bert Bridges, I was accorded time and quiet enough to announce that the *refreshments* had been donated by generous classmates and the cigars, cigarettes, and candy by Ben Hurvitz, thus costing the class treasury nothing; that plans for our coming 25th reunion will be announced next fall; that there'd be a free class cocktail party at the Boston Statler, Monday, June 5, from four to seven; that when one of our classmates complained of not having received his dinner notices we checked his address and found one address on St. Botolph Street, care of Anne, and one address on Newbury Street, no name. Naturally we are withholding his name.

We were just about to proceed with our entertainment when Jac Sindler announced a gift from anonymous subscribers for one in the Class who gave generously but modestly of his time, interest, and loyalty to class work and deserved consideration for it. A hush fell over our erstwhile gay and festive board as I apprehensively and suspiciously opened a gayly and stunningly wrapped packet to expose a beautiful blue vase with card attached: "To George, with love, from his boys." Now that was a nice thought from somebody for the old Pirate, but before George could reach for the gift, a terrific argument was whipped up whether he should or should not have it — with reflections on the doubtful masculinity of the sentiment on the gift card. Some led with lefts, others with rights; some from this corner, some from that corner. At the end of the third round the score stood: donors 0, objectors 5. It began to look as though the meeting should be run on Marquis of Queensbury rules instead of parliamentary rules. In my bewilderment to maintain order I sought for a gavel, instantly supplied by Speed Swift in the form of a huge wooden mallet which I could hardly lift. As the hostilities approached the heated stage of possible conflict, a happy and peaceful ending was had by all by smashing the beautiful blue vase to bits with the mallet — a disappointment to George but fun for the rest.

And so to the Honorable Herb Swift's football movies, class reunion and dinner shots embellished by femininely artistic appeals to "Help Azel." I hope no one present or reading these notes takes the wrong slant on that. And then the Dishonorable (so listed on the attendance sign-up sheet) Bert Adams entertained us, fascinated us, and fooled us for an hour with his most mystifying and enjoyable tricks of legerdemain. He left us "talking to ourselves" trying to figure how he does it. All in all a very happy and pleasant evening, typifying the splendid camaraderie of our Class and the fine friendships we prize with one another.

Joe Livermore, unable to attend, sent his regards from a Lockwood, Greene construction job in Binghamton, N.Y. Frank Scully was ill at home. Charlie Norton (in Boston circulation again), Art Nelson, Fred Waters, Loring Hayward — all usual attendants — were unfortunately absent.

What this Class needs is more Jerry Coldwells. Just peruse this delightful letter from the much and constantly traveled Jerry, written on March 24 from the glamour spot, Sun Valley, Idaho. Jerry makes me feel good, as, somehow, I can always rely on him to produce a hit when we need runs: "The [class notes in the] last couple of issues of The Review look a . . . lot better than the previous ones. Of course it is just barely possible that more material may be the cause. I am on my way back from my second trip to the Coast this year so far, and I have hopes that it will be the last this year, but you never can tell. I thought I'd take a few days off up here and see

what the place looked like. It is quite a nice place but right now the snow is a bit scarce. Championship ski matches are being run today, tomorrow, and Sunday, and they are having a . . . time finding enough snow. I have no intentions of skiing, so it doesn't make much difference to me. The weather is quite hot during the day — 90 degrees — and I haven't worn an overcoat since I arrived.

"While in San Francisco this last time I saw the fair — twice in fact. I don't pretend to be any great judge of fairs but that one is not yet completed. The setting is very fine, and the lighting effects at night are exceptionally well done. . . . I was in Boston about a month ago and had dinner with Clive and Mona Lacy. Another night I had dinner with George White '18 and I was only there two nights! Frank Scully was out of town, Weare Howlett was in Florida, and I couldn't reach you. . . ." — Thanks a lot, Jerry. Sorry to miss you in Boston and do hope to see you soon — at least before 1940.

So! come to the class cocktail party at the Boston Statler, Monday, June 5, from four to seven and bring your guests; family, friends, and relatives; wives, daughters, and sweethearts. All to "Help Azel." — AZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline, Mass.

1916

Hovey Freeman, who was about to sail for Europe at the end of March, unburdened himself as follows to your Secretary: "I had expected to leave for England . . . on the S.S. *Queen Mary* but received a cable . . . from our friends at Lloyd's that conditions were so hectic in London and people so upset by the international situation that they requested that our trip be postponed. As to how soon I will go I do not know. Of course a great deal depends on your friend Herr Hitler. We had our tickets, our various documents, and so on, all assembled; we had our letters of credit and our bags practically packed. So it really was quite a disappointment to have to change all our plans and defer matters to a later date.

"Those of us here in Rhode Island still talk about the hurricane. I imagine we always will. It was an experience that I do not want to go through again, for my family and I had several close calls. I was in New York trying to get back on the *Merchants Limited*. Got as far as New Haven, arriving there at midnight instead of six-twenty, when they came through the train and announced that the train was going back to New York as they could not continue, due to washed-out bridges. I got off the train with Walter Humphreys '97 and another Tech man, Ernest Kerr '14, and we tried to get rooms at the various New Haven hotels but without success. Finally we lost Walter in the New Haven station as the crowd was terrific and in spite of looking for him for about ten minutes were unable to find him. I then found a taxicab driver who was willing to try to drive through to Providence, and Kerr and I started. We tried every road from the shore road to the Springfield-Boston road

1916 Continued

but were blocked every time either by high water or by fallen trees or other debris on the road. We landed back in New Haven at about daybreak and again started on the shore road, finally getting through to New London, where we saw the tag end of the fire, and continuing on to Providence, arriving in the mid-afternoon.

"At one point in our travels we had a very close call. What looked like about a foot of water in the road proved, upon examination when we walked ahead with a flashlight, to be a complete washout, and there was one automobile still down in the gap with its top just showing. Some poor devil had apparently come to an untimely ending there. All during the night our taxicab radio gave us news flashes, most of which fortunately proved to be gross exaggerations as to conditions in Providence. However, they were terrifying at the time. Upon arriving in Providence we of course immediately saw signs of the tremendous damage that had been done by the high water. Our own office building had been surrounded by seven feet of water in the streets, and it was 10:00 P.M. that night before the employees were able to get out. Of course trees were down everywhere and there was no telephone or electric service, so that business was at an absolute standstill. As you know, even the mails could not get through for a while.

"I then tried to get down to my summer home, where my family were. Found most of the roads blocked but finally was able to get within about four miles, and I then walked in from there, carrying a half dozen loaves of bread and some meat. The two roads had been washed out, and cars could not pass. When I got down there I found that my family were all safe, although my summer home was a sight that I will never forget. The house itself stood up beautifully. A few holes in the roof and some broken glass, but otherwise not much damage. However, I lost 69 large trees, about 40 to 60 feet of shore, my dock was completely gone and so were my boats, bathhouse, and so on. The two smallest children had a miraculous escape when the large plate-glass window in my house broke. Two of my daughters tried to drive down after school during the height of the storm. They had gone across a bridge, found the road blocked, and then returned across the bridge again, getting stuck at the end of it due to high water. They sat there and watched the bridge go out carrying four automobiles with it. I consider myself most fortunate. . . .

"I get to Boston every week or two and occasionally drop around to see my oldest son who is a junior at the Institute. Thus I am able to keep in touch pretty much with what is going on. . . . I frequently run into Saul Makepeace, who, incidentally, lost his summer house in the hurricane, and Theron Curtis, both of whom you will remember as members of our Class. I also ran into one of the Stewart twins the other day. I think it was Walter, although I am never sure unless I see them both together." —

JAMES A. BURBANK, *Secretary*, The Travelers Insurance Company, Hartford, Conn.
STEVEN R. BERKE, *Associate Secretary*, Coleman Brothers Corporation, 245 State Street, Boston, Mass.

1917

In the April class notes my sponsors, Messrs. Stevens and Hulburd, announced that I had graciously consented to appear on this program. I did nothing of the kind; I made the error of making a few uncomplimentary remarks about the literary quality of some of their efforts and in so doing stuck out my neck. Before I could pull it in, said neck was promptly and vigorously stepped on, and the punishment was made to fit the crime. However, the joy of being relieved of the job for a month as reflected in the beaming countenance of Mr. Stevens and in the sighs of relief emitted by Mr. Hulburd makes the job worth while. So here goes. We hope you like it.

First of all may I express my thanks to those who answered my plea for news. Those who did not are forgiven, including Gus Farnsworth, whose secretary writes that he left town with his coattails flying, without having time to write me. She neglected to say who was chasing him.

International: A recent issue of the New York Post carried an inside headline stating that the Windsors are doing well on a diet centering around garlic. The confirming authority for this startling bit of information was our old friend Herman L. Rogers, who had just arrived from abroad and who is described as the closest American friend of the Duke and Duchess of Windsor. Who is to say that M.I.T. does not give an education which has a broadening influence.

Philadelphia: We learn that Walt Beadle has been elected president of the Technology Club of Philadelphia. He had left the meeting before they got around to the business of electing, and they took advantage of him. In his inaugural address he expressed agreeable surprise to learn that his Club has a representative on the Alumni Council in the person of one Ray Stevens. Walt states that he has been actively associated with the Philadelphia Club for 19 years and to the best of his knowledge and belief they have never before during this period been honored with representation on the Council. He extends a cordial invitation to Ray to visit his constituents. All this is not very complimentary to Representative Stevens' political acumen, for to the best of my knowledge and belief he has been the representative of this same Club for most, if not all, of those same 19 years. You two boys had better get together. — We have two reports concerning Dud Bell: one that he is quote itching to get married but won't admit it unquote and the other that he still aspires to be a playwright.

Chicago: We had Dick Whitney signed up to cover the big alumni dinner in Chicago, but he was unfortunately called to New York and can tell us nothing. This is exactly the same information we

have been able to get from Sherry O'Brien, who was chairman of the dinner committee, and Penn Brooks, who was there in a dual capacity representing Sears, Roebuck and Company and Westbrook, Maine. In the latter capacity Penn was only pinch-hitting for the still No. 1 native of the town of Westbrook, Mr. Vallee. We cannot imagine a crowd of 17 men getting together on an occasion like this without something newsworthy happening and can only conclude that these gentlemen were perhaps not in condition to remember. Penn was in Boston a few weeks ago and made a confidential report to Dean Lobdell, but you know how hard it is to get anything out once it has gone into the confidential file of the Dean's Office, so we still know nothing. We can only hope that the honor and reputation of the Class was upheld in every respect.

New York: Bob Marlow is catching up on his reading at the Queens General Hospital, Jamaica, L.I. He was hit by an automobile while crossing the street near his home and was badly injured, his injuries including six broken ribs. He is coming along nicely now. — Dix Proctor has been helping Mr. Dewey make New York a better place to live in by doing his turn at jury duty. — The Tech Club of New York, a favorite hangout for some of the crowd in years gone by, has merged with the Williams Club. The address is 24 East 39th Street.

Washington: Some people have such a droll idea of what constitutes news. For example, Potts Mehaffey proclaims to all who care to listen that he has had no more children, five being his limit, and that he is getting fat. Our only comment is that Time Marches On! He gets around to the Tech Club meetings occasionally, which we gather are quite decorous affairs. Potts says that they don't drink much, in fact they don't drink at all. They make him "yearn for the inspiration of a technological toot."

Here and There: No program would be complete without a few advertising plugs. We are glad to contribute the free space which belongs to The Review. Will you kindly mention my sponsors when making your purchases? When Bob Erb went with the J. F. McElwain Company, they were making 1,000 pairs of shoes a day. They are now turning out 43,000 pairs daily to keep the 650 Thom McAn stores supplied. Frank Butterworth is offering competition, and reports that his factory, the Marion, Ind., plant of the Daly Brothers Shoe Company, Inc., has the largest number of employees in its history. Dick Whitney and Bob Harkness are friendly competitors in Chicago. Bob is western advertising manager for the *Woman's Home Companion*. Dick reports that business with Redbook is encouraging and well ahead of last year. Al Moody has joined the sales force of the Keasbey and Mattison Company and will be located in the Chicago district office. I should give Al a rebate on this one, for I am so ignorant that I don't even know what this company makes. In the paint field Dean Parker is

You will find on page 1 information on Alumni Day, June 5

president of the Philadelphia Paint Executives Club. Stan Dunning is in Montreal organizing the Canadian Water Paints, Ltd. Art Gilmour has taken over Rafnell's Paint Store in Lewiston, Maine, which will become Gilmour's, Inc., and handle Carmote paint and wallpapers. The New York Times book section of March 12 carried a good review of Irving Fineman's latest book, "Doctor Addams." Price \$2.50 if you want to find out how love and science mix or don't mix.

There is no scheduled reunion this June, but if you are going to be here for Alumni Day, let Ray know. An impromptu party can be arranged on short notice. And so to bed. Please omit flowers. — Ted Bernard, sponsored by: RAYMOND STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass. PHILIP E. HULBURD, *Assistant Secretary*, Phillips Exeter Academy, Exeter, N.H.

1918

Your Secretary is ashamed that no notes were in The Review last month, but business has to come before pleasure, and things were piled high at school, so I could not even get the notes in after the dead line as I wanted to do. I will try to make up for it this time. — The New York Times of Saturday, March 11, held the following notice which is of interest to us. Miss Florence Theresa Wagner of Forest Hills, Queens, was married at the Hotel Beekman on March 10 to Granville B. Smith, son of the late Mr. and Mrs. Augustin Coleman Smith of New York. The bride and bridegroom had Robert L. Rockefeller '25 and Mrs. Rockefeller as their only attendants. They went by plane for a brief wedding trip to Bermuda. They will reside at 360 East Fifty-fifth Street, New York City. — Henry Pinkerton, VII and M.D. (Harvard '24), has been appointed director of the department of pathology at St. Louis University. He has been assistant professor of pathology at the Harvard Medical School.

The second edition of the "Eighteenth Amendment," or the "Repeal of the Eighteenth Amendment," is finally in the hands of those who subscribed. Our President worked hard against great odds to prepare this volume, and it is his stick-to-itiveness that we can thank for having such a volume at this time. Ten years ago I worked with him in getting out the first volume, so I know what a job it is, but this year he did the job completely by himself. I must confess that I haven't had the time to go from cover to cover as yet but have gone most of the way, and it certainly is well worth the money paid for it. More of the Class should have answered Maggie's letters and subscribed to the book. When the third edition comes out, I do hope that we have direct communication from one and all and that a large subscription list will be forthcoming.

It is with regret that I announce the death, on February 11, of our classmate Andrew J. Smith of Arlington, Mass. He was sales manager of the National Cash Register Company of Boston. — The

sympathy of the Class goes to Charlie Tavenor upon the death of his mother and to Pete Sanger upon the sudden death of his father, since the last notes were sent in.

On February 14 the New York contingent had a dinner at the combined Williams and Tech Club. Your Secretary had been expecting to attend, but after arrangements had been made it was discovered that no women are allowed, so she remained at home. The following information was given to me by Pete Sanger, who seems to be taking over the job of getting the 1918 gang together once in a while in this vicinity. Those present were Ev Rowe, Asher Joslin, Clarence Fuller, Walt Robertson, Phil Dinkins, Tom Brosnahan, Art Smith, Pete Sanger, and Art Ueberlacher, who hasn't been in touch with the group for over 15 years. We sincerely hope that he is back in the fold again and will attend all gatherings from now on. After an excellent dinner when plain talk was at a standstill, it was suggested that each one of the fellows give a history of what he had done since he left school. Ed Rowe, Asher Joslin, and Clarence Fuller succeeded in covering the past 20 years quite completely with their stories. By the time these three had finished it was time to break up the meeting, but we are assured that when they next meet, others of the group are going to tell their stories.

Will members of the Class please send in items of interest as they see or hear of them? The only way that your Secretary can keep notes appearing is to have something to put in. — GRETCHEN A. PALMER, *Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

1920

Since notes last appeared in The Review your Secretary has had the pleasure of seeing Ken Akers and Al Burke at a Course XV gathering, and Buck Clark and Jim Gibson at one of the miniature class reunions at Patten's Restaurant on Friday noons. The foregoing pair and the Bugbee twins constitute the quorum, and the meetings are far from regular, what with Perk Bugbee and Jim Gibson traveling all over the map and Buck coming up from Hartford. Nevertheless, other classmates would be heartily welcomed if they happened to connect on the right Friday. All of these classmates appear to be standing the years remarkably well, the only notable features being Ken Akers' copious white thatch, Al Burke's lack of any thatch, and your Secretary's combination of the two.

I have a note from Norrie Abbott, Assistant Treasurer of the Manufacturers Mutual Fire Insurance Company, 815 Grosvenor Building, Providence, R.I., saying that Terry Johnson is also associated with the same company as a field engineer in the New York office at 52 Vanderbilt Avenue. Norrie advises that it is not too early to mention that our 20th reunion is looming up even more conspicuously than the presidential election and that all loyal members of 1920 ought to start making plans now for a

big week-end in 1940. If any of you have red-hot suggestions as to place and program, don't fail to send them along any time to Norrie or the writer. We'll guarantee that they won't be filed away and forgotten.

Bud Cofren has associated his diploma and plate printing business with the J. L. Hammett Company of Cambridge and may be found at 290 Main Street. — Witold Kosicki is with the Metalloy Products Company of Detroit. He recently returned from a six months' business trip to Poland and was the only one from this country to attend the International Foundrymen's Congress at Warsaw. — Hobart O. Davidson has been prominently featured in the news recently because of his promotion to the very important position of chief engineer of the American Viscose Corporation at Marcus Hook, Pa. H.O. has had the kind of career that everyone expected of him. Starting with the National Refrigeration Company he soon became associated with American Viscose and in 1927 was sent to England. Upon his return to this country he designed and supervised construction of the Meadville plant and has been located there until his recent promotion. His place at Meadville is filled by M. B. Morgan '26. To H. O. Davidson go the congratulations and best wishes for continued success from his admiring classmates.

Harland Gray has been made a captain of the United States Army and is at present located at Sub District No. 9, New Gretna, N.J. Professor John Mitsch has recently moved his home to Milton, Mass., 28 Brandon Road. Dick Gee's present address is 661 High Street, Fall River. George I. Brown is now at 6121 North Winthrop Avenue, Chicago, Ill. Ed Cousins of Course V has moved to Cumberland, Md., Box 423. Jack Coyle has left Bridgeport and is now living in Fairfield, Conn., at 407 Meadowbrook Road. Bill Dewey has left Ohio and is now at 107 Herrman Avenue, South, Auburn, N.Y. Foster B. Doane is in Wilmette, Ill. Eric L. Etherington is with Southgate and Company, 33 State Street, Boston. Clem Hallinan has moved to Plainville, Conn. Frank Lawton is with the Texas Company at Houston, Texas. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

1921

Thanks to Ray's timely assistance during this extreme low in our supply of notes, here's a lot of news he gathered on his usual extensive travels and sent us on one of those rare occasions in which he is momentarily to be found at home.

C. Harry R. Johnson, II, who has been in Manchester, Conn., for the past two years in charge of the experimental paper mill with the Raybestos-Manhattan Paper Division, left during February to join the Consolidated Paper Company, Monroe, Mich., in an executive capacity. — Herbert W. Reinhard, XV, is reported to have left the Schwarz Paper Company of Chicago, for whom he has been applying his wide marketing experience in the

1921 Continued

paper industry. Herb makes his home at 1460 Pitner Avenue, Evanston, Ill. He is married and has a four-year-old boy, Billy. — Leo C. Pelkus, X, is owner and manager of the Commonwealth Electric and Manufacturing Company, 83 Boston Street, Boston, specializing in electric heating equipment. Leo is also associated with E. L. Wiegand Company of Pittsburgh as an electric heating engineer. He is one of the few of the Class who has not succumbed to Cupid's marksmanship and is on record to the effect that he thinks he is lucky. Included among Leo's activities are the duties of being vice-president and treasurer of the Boston Turn Verein.

Oscar F. Neitzke, X-A, has resigned as research director of Bennett, Inc., Cambridge, to assume his new duties as research and development engineer with the Hollingsworth and Whitney Company, Winslow, Maine. — Herbert A. Kaufmann, X, who has been associated with Stein, Hall and Company, Inc., for the past 12 years, has joined the production staff of the American Maize Products Company. Herb's work has previously been directed toward developing technical uses for dextrans and starches, and he will henceforth be concerned with the production of these materials.

On March 15, we attended a regional dinner meeting of about 30 members of the M.I.T. Club of Northern New Jersey who reside near the Elks Club of Ridgewood. Sumner Haywood, X, put his New York Telephone Company "voice with the smile" to excellent use as toastmaster for the occasion. William H. Young, Jr., II, was there also. Bill looks not a whit different, neglecting the couple of extra ounces which all of us seem to amass. He is a patent attorney with offices at 140 Market Street, Paterson, N.J.

Transplanted '21 men now will be found at these new addresses: James J. Birnie, X, Loudon Woods, Rye, N.Y.; Samuel T. Drew, I, American Consul, Caracas, Venezuela, South America; John M. Gundry, Jr., XV, "Caprice," Nassau, Bahama Islands; Eugene A. Hardin, I, 202 Edge Cliff Drive, Highland Park, Ill.; Mrs. Malcolm B. Lees, IV, 188 Gramercy Place, Glen Rock, N.J.; Dr. Hugh E. McKinstrey, XII, Room 1700, 84 William Street, New York, N.Y.; Robert L. Pine, II, Pine and Company, 220 Winters Building, Dayton, Ohio; Thomas W. Proctor, I, Darlington, Md.; Elliott B. Roberts, I, 601 Federal Building, Seattle, Wash.; Warren G. Waterman, Jr., VI, R.F.D., Frankfort, Mich.; Frank H. E. Whelan, I, 467 Washington Street, Brighton, Mass.; Lawrence L. Willard, II, United States Army Engineers, Industrial Trust Building, Providence, R.I.

If you stop to see the New York World's Fair on your way to Cambridge for Alumni Day, don't fail to phone your Assistant Secretary at Walker 5-6475. In any event, please jot down some news and mail it to us now. — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company,

Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, 10 University Avenue, Chatham, N.J.

1922

News from the Class has been as scarce in March as sunshine or the flowers that bloom in the spring. Your Secretary hopes that the end of the hibernating season will bring an end to the hibernation of news. Several of us have enjoyed talking with William C. Gilman, VI-A, who is back in New York after his association with the Securities and Exchange Commission in Washington. Bill went to Washington in 1935 to organize and administer the public utility division of the S.E.C. and returned to New York about a year ago to found the firm of Gilman and Hickey, consultants in the engineering and financial field. Bill lives in Westport, Conn.

Recent address changes follow: George P. Anderson, XV, from Auburn, N.Y., to Wyomissing, Reading, Pa., care of E. L. Hoffman, 18 Berks Place; Carroll A. Black, XV, from Lowell to Post Office Box 75, Bangor, Maine; Albert A. Gioiosa, II, from Bethesda, Md., to 12 Shirley Street, Quincy, Mass.; Harold J. LeCour, II, from Winthrop, Mass., to 3633 209th Street, Bayside, Long Island, N.Y.; Ian H. Parsons, from Hollywood, Calif., to Balt Road, Harmordoworth, London, England, where he is associated with Technicolor, Ltd.; Lieutenant Colonel Dwight F. Johns, I, from Washington, D.C., to Fort Leavenworth, Kansas; George H. Rhodes, V, from New York City to 80 West Pierrepont Avenue, Rutherford, N.J.; Lawrence H. Connell, VI, from Denver, Colo., to Detroit Edison Company, 2000 Second Avenue, Detroit, Mich.; Edward D. Coogan, VI, from New York City to 274 Otis Street, West Newton, Mass.; and Lieutenant Kenneth S. Davis, X, from Woods Hole, Mass., to the Maritime Service Training Station, Hoffman Island, N.Y.

There are many address changes which are sent to the Secretary from the Register of Former Students at the Institute. We are not publishing in The Review changes from one address to another in the same locality but only those changes in which a change of activity or a major geographical change is indicated. The Secretary maintains in his business office an up-to-date record of the addresses of the Class insofar as the record is known to the Institute, and members of the Class who come to New York or wish to use this address file to locate their acquaintances are quite welcome. — CLAYTON D. GROVER, *Secretary*, Whitehead Metal Products Company, Inc., 303 West 10th Street, New York, N.Y. C. YARDLEY CHITTICK, *Assistant Secretary*, 77 Franklin Street, Boston, Mass.

1923

A card of inquiry to Bill Tayler recently brought me the following self-explanatory reply from Mrs. F. W. Tayler, his mother: "Bill is married, has a home at 722 Glen Avenue, Westfield, N.J., and a seven-year-old son. He is

export manager of United States Machinery Company, 115 Broad Street, New York, and practically commutes to Europe. He and his wife are now in Australia where he sold a woodworking plant, and he will probably get to India and Africa before he gets back to America."

Pete Pennypacker reports that Bethlehem Shipbuilding Corporation's Fore River plant, where he works, is plenty busy right now. Pete was recently promoted to chief estimator. — E. G. Creek, writing from 2925 Victor Street, Kansas City, Mo., reports he has been elected to a principalship in the school system of that city. He is in charge of the Edwin C. Meservey School, having transferred there from a school in St. Joseph, Mo.

Gilbert Whitehead is field engineer for Belden, Inc., a subsidiary of Atlantic Gulf and Pacific Company, 77 Muelle de la Industrie (Post Office Box 626), Manila, P. I. Whitehead was formerly consulting geologist for the Angelo Mining Company in the Philippines and was at one time geologist for the United Verde Copper Company at Jerome, Ariz. He left Jerome early in 1930 to accept a position as geologist at the Froid mine of the International Nickel Company of Canada. (This item was made possible through the courtesy of Professor Locke '96.)

We hope you're making plans to be on hand on Alumni Day, June 5. There will be an informal get-together of '23 men at the noonday luncheon in the Great Court, and a '23 table or two at the dinner. — HORATIO L. BOND, *Secretary*, 457 Washington Street, Braintree, Mass. JAMES A. PENNYPACKER, *Assistant Secretary*, 96 Monroe Road, Quincy, Mass.

1924

Attending the '24 dinner dance in New York City, held just too late to make the April notes, were Correale, Gruenher, Shea, Winger, Brimberg, Schooler, MacNaught, Di Somma, Black, Shore, Arapakis, Whittington, Piland, Hecht, and several members of other Classes, including Dandrow and Mueser of 1922 and Al Glassett '20, President of the Technology Club of New York.

An interesting letter from Blay Atherton recounts some of his doings since graduation: "... I am one of the New Englanders who have stayed within a radius of 50 miles of Boston since we received our diplomas in 1924. In the school year of '24 and '25 I was assistant to Professor Shughrue, whom you doubtless remember as the professor of accounting. The next year I was with Jordan Marsh Company in their merchandising-planning department and afterward was assistant manager of employment with that organization. Late in 1926 I resigned to enter the life insurance business in my old home town of Nashua, N.H., and have been here ever since. At present, I am operating an agency of the New England Mutual Life Insurance Company, and between the business and our three daughters — aged 13, eight, and five — Kay and I manage to keep very busy.

You will find on page I information on Alumni Day, June 5

1924 Continued

"Last fall I was reëlected to the New Hampshire legislature and have been having an interesting time as the chairman of the committee on banks. Just now we are deciding whether or not New Hampshire will permit branch banking, and have had many interesting hearings on this subject. Herbert D. Swift '15 is the No. 2 man on my committee and we have found another Tech Alumnus in our legislature, Arthur L. Hamilton '99 of Lisbon. He and I served on the banks committee in the 1937 session, but I did not know he was a Tech man until the other day. At one of our recent hearings, McKenzie '14, President of the Derry National Bank, appeared before our committee as one of the proponents of the bill. . . . Blay concludes with a cordial invitation to visit him in Nashua, at 100 Main Street.

If your reservation and movies for the reunion are not in yet, don't forget the dates, June 3, 4, and 5. — FRANCIS A. BARRETT, *General Secretary*, 50 Oliver Street, Boston, Mass.

1926

From New Orleans comes a note from the Secretary of one of our sister Classes, Ray Hibbert '27, yielding information about Bill Millar, once of Africa, now of New York. The peregrinations of Bill since he graduated have been extensive and Marco Poloish. He has plied his trade in darkest Africa, in the big timber of Canada, and in other obscure and exotic purlieus of the world, but now he is back mundanely occupying himself in the mining department of the Johns-Manville Corporation. This may mean that he continues his travels, but at any rate he has been for a period in the commonplace and hard-to-write-about reaches of New York City.

Giles E. Hopkins, for contrast, has been one of our most stabilized and stationary citizens, having occupied himself since 1929 with the technical problems of the Bigelow-Sanford Carpet Company. In an obscure publication we now note that he has resigned his position as technical director and carpet expert to join the United Shoe Machinery Corporation. Hoppy has been active in the American Society for Testing Materials and the Industrial Research Institute, has been associated with the National Research Council, and has been in the United States Institute for Textile Research. He served on the executive committees of the A.S.T.M. and the I.R.I., and was a director of the U.S.I.T.R. We leave the decoding of this alphabetical achievement list to you.

Whitney Ashbridge, in one of his welcome though hasty notes, recently reported that he was continuing his career as an engineer with Day and Zimmerman of Philadelphia. Whitney is showing esthetic proclivities, mainly in the direction of linoleum carving. He has developed a technique that is wholly individual and promising for the future. — Usually we try to end these minutes with nuptial tidings, but this time we are left standing at the altar. This is a

parlous state of affairs that we hope will be rectified by the onset of the vernal season. — J. RHYNE KILLIAN, JR., *General Secretary*, Room 3-208, M.I.T., Cambridge, Mass.

1929

Alumni Day, June 5. How many of you will be there? Have you all planned to join us in celebrating our 10-year reunion at Ye Castle Inn, Saybrook, Conn., June 2, 3, and 4? Fish Hills, Eric Bianchi, and Brig Allen assure us that a memorable time will be had by all of us who journey to Saybrook in June. Let us get together now when we will recognize each other, for when our next 10-year anniversary rolls around it will be difficult to recognize those old faces and figures, eh what! All out for the reunion. Make Saybrook our goal. See you there June 2. — EARL W. GLEN, *General Secretary*, Box 178, Fairlawn, Ohio.

1931

Thanks to John Higgins we have a pleasing variation from the usual monthly column. As mentioned in the March Review, John has sent us a story of his trip to Europe: "I got a three months' leave of absence from the Placement Bureau, sailed from Boston direct to Scotland, bought a bicycle in Glasgow, spent an afternoon at the Empire Exhibition there, and set off for Edinburgh via Loch Lomond. Two days and several dozen sore muscles later I pedaled into this Athens of the North. I spent an interesting week-end wandering through some of the fascinating historic places of Edinburgh. . . . Scotland offers the cyclist plenty of showers but gives him in return the greenest grass and the most beautiful valleys he could ask for.

"Entered England near Carlisle and spent a day cycling through some of the beautiful lake district near Windermere. . . . Shrewsbury, Worcester, Stratford (where I happened on a performance of 'The Tempest'), Oxford (which I explored in the rain), Salisbury and Stonehenge, Winchester brought me at last to London some three weeks after departing from Glasgow. London reminds you somehow of the older portions of Boston extended a hundredfold. While cycling through England I spent most of my one-night stops at 'bed and breakfast' places at four or five shillings a night. . . .

"A channel steamer carried me and my bicycle from the city of London down the Thames and over to Ostend in Belgium. Three days in Belgium took me through the fascinating medieval towns of Bruges and Ghent, and then I reached the bustling and gay city of Antwerp. From there I pedaled into Holland, where I visited The Hague, with Scheveningen beach, Rotterdam, and Amsterdam. The latter city seemed to have half of its million inhabitants riding bicycles at dizzy speeds through its canal-bisected streets, and I came near being run over several times. . . .

"From Amsterdam I took a train to Cologne, Germany, where I got my first glimpse of one of the great Gothic

cathedrals. . . . A leisurely, sun-baked, two-day steamer trip up the Rhine to Mainz was a welcome change from cycling. At Coblenz . . . I had a chance to sample the vintages that the Rhine so justifiably boasts of, and I toasted German-American friendship with a couple of German lads until the wee small hours. Heidelberg was interesting but very hot, and I was glad to spend the next week cycling leisurely through the Black Forest from north to south. It . . . offers a varied and always interesting succession of wooded hills and valleys somewhat reminiscent of the Adirondacks. . . .

"The southern extremity of the Black Forest led me into Switzerland at Basel, an old and fascinating city on the upper Rhine. Here I sold the bicycle, having decided to use foot and train travel from then on. I went first to Lucerne, which, with its setting on the Lake of Lucerne with rows of Alps extending into the distance on every side, is incredibly beautiful. I climbed Mount Rigi (one of the small Alps — a mere 5,000 feet) and was stiff for several days. Interlaken was a great disappointment. It rained for two days, and I got only one brief glimpse of the Jungfrau. Two days of rain in Interlaken convinced me that a week in sunny Italy would be a swell idea, so the next morning I took a train over the Simplon Pass into Italy and Milan. Italy was really a notable experience, and my projected six days there stretched easily into nine. It was hot, August weather, and I had a great deal of train travel to do, but each day was packed full of such unusual, colorful, unforgettable sights that the time passed like a dream. Milan with its lacy marble cathedral, Genoa, Pisa, Rome, Naples, Florence in turn offered attractions that packed every waking hour. Rome with its ruins and churches, Naples with Vesuvius and sunbaked Pompeii were high lights, but Florence was probably the supreme joy. . . .

"Reluctantly leaving Italy I returned to Switzerland, and went to Zermatt, a small town some 5,000 feet high and commanding an indescribable view of the grim, three-mile-high Matterhorn. . . . From there I went down the broad Rhone valley to Lake Geneva, which I crossed by steamer from Vevey to Geneva. I spent a pleasant couple of days in the latter city and saw the newly and somewhat untimely completed League of Nations palace.

"An express carried me from Geneva to Paris, and once there I found it hard to tear myself away to see some of rural France. However, after a week of wandering around the boulevards, the Louvre, the banks of the Seine, Montmartre, and so on, I did manage to get away into Normandy for a few days. I stopped at Rouen, where Joan of Arc was burned, took a steamer down the Seine to le Havre, spent a quiet week-end at Deauville, made an excursion to Mont-Saint-Michel, the remarkably and architecturally unique abbey-fortress on an islet off the Norman coast. Then back to Paris . . . one more train journey to Boulogne,

1931 Continued

and the boat to New York. This lengthy, but nonetheless sketchy, account will give you some idea of what a swell summer it was. I made my plans and travel arrangements as I went along, and between them and sight-seeing there was scarcely one dull moment in three months. Language difficulties were occasionally embarrassing but more often funny, and getting to know the various foreign exchanges and coins (not to mention the European railroad timetables) were just the things to appeal to a technically trained mind.

"The shadow of war wasn't quite so impelling as American newspapers would have you believe. There was no question in anyone's mind apparently that war was an ever present possibility, but people did not dwell on it any more than they had to. The impression was unmistakable everywhere that no one really wanted war. I left Paris on September 10, only a couple of weeks before the Munich crisis, but there was no such pandemonium evident as the American newspapers like to describe. The Parisians seemed to be more irritated than frightened by their inability to guess what Hitler was going to do. Regimentation is pretty unmistakable in Germany, and one gets pretty sick of uniforms, *Hiel* Hitlers, and anti-Jewish signs. On the other hand, the hospitality and innate friendliness of the German people must be evident to anyone who travels in that country. Uniforms are numerous in Italy also but not so much as in Germany, and the Italians do not seem to take to regimentation so readily as the Germans.

"Not the least of the charms of foreign travel is the new insight it gives you on your own United States, and you find yourself returning to them with a broader and more sympathetic understanding of our problems and a feeling that none of them is so grave and deep-rooted as those facing Europe."

Many thanks for your newsy and informative letter, John. We hope that you will become a regular contributor to this column. — BENJAMIN W. STEVERMAN, *General Secretary*, 11 Glenland Road, Chestnut Hill, Mass.

1933

It is now time to start making plans for coming to Alumni Day at the Institute, on June 5. Although this is not one of our five-year celebrations, we hope to have a goodly number of '33 men there. — The news, this month, is confined to announcements from the society column. It is a pleasure to announce both the marriage of Miss Dorothy Gibbs to Alfred William Garnell on December 27 and the engagement of Roland D. Glenn to Miss Eleanor Norwood Greene. Glenn is now associated with the Carbide and Carbon Chemicals Corporation at Charleston, W. Va., and this year is doing graduate work in business administration at the Institute.

That's the extent of our news for this time and we hope we have more for you next month. — GEORGE HENNING, JR., *General Secretary*, Belmont Smelting and

Refining Works, Inc., 330 Belmont Avenue, Brooklyn, N. Y. ROBERT M. KIMBALL, *Assistant Secretary*, Room 3-102, M.I.T., Cambridge, Mass.

1934

Cheer up, men! Only one month is left to wait before you pack your bags and start trekking Hubward to the grand royal shindig. What a spot! What a program! What a tragedy it would be to miss it! If your conscience has been bothering you for not writing to some of your old pals for the last five years, let it trouble you no more — you can offer your apologies personally at the reunion. If you miss this chance, it will be five years before you get another one.

Carl P. Stratton had a theoretical rest period for four months, from early July until the last of September, while the East Helena plant of the American Smelting and Refining Company was closed by a strike which was called when a reduction of wages was announced. Actually Stratton's vacation was a watchman's job which was not particularly arduous. The strike was a nice peaceful affair, so that there was no excitement. His work at this smelter has been very satisfactory. After graduating from the assay office he went into the Cottrell and baghouse plant, where he remained up to the time of the strike. Since the strike he has had the job of running the Dwight-Lloyd department and has been very busy, because the plant has been trying to make up the time lost during the strike. He reports that Stan Lane is still assaying but is next in line to go out into the plant.

Don't forget your swimming suit!

E. Philip Kron, our reunion chairman for the Rochester territory, has a bit of news which is now eight and a half months old but very important just the same. It answers to the name of Philip and has a smile just like his old man. Congratulations, Phil and Eleanor. As you already know, Phil is doing a good job of industrial engineering for the Eastman Kodak Company and is devoting part of his spare time to teaching a course in report writing at the Mechanics Institute in Rochester.

Be sure to polish up your golf clubs.

Henry Backenstoss, who is still working for Jackson and Moreland in Boston, has just been sent down to Pennsylvania for a couple of months on an engineering job.

Bring along some old clothes.

The society page this month is rather limited, but what we have to offer should be of interest to most of the Class. Proctor Wetherill has succumbed at last to the onslaught of Dan Cupid: He is engaged to Miss Louise Howell Kirkpatrick, daughter of Mrs. Crane Kirkpatrick of Westover Hills, Wilmington, Del. Proctor is working for E. I. du Pont de Nemours and Company. — Another victim of the barbed arrow is Ed Rickard. His betrothed is Miss Elisabeth B. Jones, daughter of Mr. and Mrs. Samuel R. Jones of Cranford, N.J. — Carleton Ellis, Jr., also makes the list for getting himself engaged to Miss Anne

Winston, daughter of Mr. and Mrs. Charles Farwell Winston of Lake Forest, Ill. Last summer when Prince Bertril, son of Crown Prince Gustaf Adolf of Sweden, was visiting America, the role of being hostess to him fell to Miss Winston. Now her lot will be looking after Carleton henceforth and evermore. We know she will play that role just as well.

Remember, fellows, it is only a hop, skip, and jump from Cambridge to the New York World's Fair; so if you are planning to attend the Fair sometime during the year, you will save expenses by taking it in after the reunion. Also if any of you have not yet sent in your five-dollar registration fee for the reunion, be sure to do it immediately. It is the only way you will be sure of getting a room and having the other arrangements made for you. Tattoo the date on the back of your hand, and we will be looking for you with bells on. — JOHN G. CALLAN, JR., *General Secretary*, 184 Ames Street, Sharon, Mass. ROBERT C. BECKER, *Assistant Secretary*, 169-49 24th Avenue, Flushing, Long Island, N.Y.

1935

As the publishing year of The Review begins to wane, we have a little more news to report than usual. Several letters came in to help make the work of your Secretary easier. From newspaper clippings we have the news that Edward Richards and Helene Holden were married January 29. Ed was with us during our sophomore year. — Dick Rice and Marjorie Bentley are engaged. Dick is with Comstock and Wescott, Inc., of Cambridge, as production manager of natural-color printing.

Last January the Boston *Evening Transcript* carried quite an article on a proposed housing development in Arlington, Mass., to be built by the Kelly Coal and Oil Company. Joe Kelly and his father are the owners and operators of the company. The development will be located just off the Concord Turnpike within easy reach of schools, stores, and transportation. The homes will be heated by Kelco unit oil burners, designed by Joe. — We belatedly report, with regret, the untimely death of one of our classmates, John A. Harrison, on October 28. John was with us during our freshman year.

Bob Lindenmeyr has joined the Falstrom Company in Passaic, N.J. We wish him success in his new work. — Jim Wickham has left the Chance-Vought Company to work for the Stearman Aircraft Company in Wichita, Kansas. Best wishes to you, too, Jim. — Mal Porter, after a sojourn in Buenos Aires, Argentina, was in Detroit, Mich., at the Seville Hotel when last heard from.

We have an interesting letter from Will Grosser. Will has undertaken some graduate work at Brooklyn Polytech, including a course in advanced differential equations during his spare time. He has been with the Federal Shipbuilding and Dry Dock Company for some time now. He reported that Beverly Dudley still

You will find on page 1 information on Alumni Day, June 5

was an associate editor of the McGraw-Hill publication, *Electronics*, but we hear that he has become managing editor of a new McGraw-Hill publication, *Photo Technique*. Will and Beverly are both interested in photography, and the arguments fly fast and thick concerning the relative merits of a Leica camera (Dudley) and those of a Zeiss (Grosser). They toured the Big City at night, taking pictures of whatever struck their fancy, but did not get into any fights over their "sniping." Will reports that Renato Iodice is now working in the hull scientific department of Federal Shipbuilding, after having spent some time in the company's shops. Renato may have matrimonial intentions in mind. Perhaps we will have more news along this line in the future. George Morrisette has been in the navy claims section of the estimating department of Federal since graduation. George has been married since early 1937 and lives in Jersey City. Will also mentioned that Herb Francis has been in the production department of Federal since graduation. A few months ago he was made assistant to the hull superintendent and is progressing rapidly. He, too, has been married since 1937 and now lives in Bloomfield, N.J. Will attended a meeting of the M.I.T. Club of Northern New Jersey, held at the Feigenspan brewery in Newark. Others present from our Class were Don Gittens, Herb Francis, Ed Gregor, and Paul Germond. The beer flowed freely, and it was not long until there was plenty of singing and general mayhem at the get-together. Many thanks for the letter, Will.

Our next letter, from Ed Loewenstein, was written on paper headed, "Edward Loewenstein, Architect." Here is Ed's contribution: "Sam Paul, IV, is happily married and the proud father of a son, David, who will be in the Class of '58, or thereabouts, in architecture, of course. Sam is living at Hewlett, Long Island, and is having quite a time designing many of the buildings at the promotion which they are trying to call a fair. Sam had quite a hand in drawing up the British Empire Building and at present is working for Skidmore ('23) and Owings, a group of Chicago architects who are doing some exhibits at the New York show. Sam writes: 'There certainly are a lot of stinko buildings, and there is the same smell of commercialism as at the Chicago Fair, but, nevertheless, it will be superior. There is an awful rush, and all architects are busy here now. After it is over, they will all be thrown out of work, and housing projects will have to absorb them.' Berney Freiberg, XV, has had quite a fast past experience. He left his job in New York as assistant building manager of a large Wall Street building, married Miss Georgia Rawley, and retired to the family seat in Cincinnati. At the present sitting, Berney is a partner in the Activisile Corporation, which manufactures visible filing systems. He has recently become the proud father of a daughter, Gael. Berney writes that on a recent business trip to Washington,

he visited the Senate, which he highly advises as a source of entertainment. It is better than any movie and cheaper, as there is no admission fee, although the railroad fare amounts to something for most of us.

"Al Alschuler, IV, is married to Helene Adler, whom we remember as senior class president at Sargent in '35. Al probably gets beaten up every night and twice on week-ends for good measure, poor fellow. . . . He is down to a mere 200 now, far from his normal self. They just remodeled a charming house in Highland Park (near Chicago) and are all set for future Alschulers to come. Al is associated with his father, who is one of the leading architects in this area. He has participated in the construction of many large buildings and factories and also devotes a large portion of his time to charities. Business here is good, almost a boom. I have been in business under my own name for quite a while now, building mostly homes, with an occasional apartment building or store." — An orchid to you, Ed, for the letter. We need more like it.

We have one more highly interesting letter this month — from Don Guleben. Don passed through Rochester and called me on the phone. Unfortunately I could not get away to see him, as I was at work, but he promised the letter which follows: "I'm still out here in the land of sunshine (well, most of the time), helping Spreckels make Honey Dew sugar. During the last 'campaign,' or operating season, from August until the end of November, we turned about 450,000 tons of sugar beets into about 170,000,000 pounds of sugar. It's just the same as cane sugar, too, and don't let anyone tell you differently (*adv.*). However, the old prejudice still exists, so beet sugar sells for slightly less than cane. Spreckels also makes cane sugar in their San Francisco refinery, so we can supply the customers with whatever they prefer. During the campaign I got a lot of good operating experience by working on some of the different stations in the process, as well as doing a lot of things like making a job analysis and evaluation of over 500 jobs in the plant, finding out why the fuel cost per bag of dried pulp was higher this year, testing a new Schutte-Koerting multirjet condenser to see if it was doing a good job, working with Taylor Instrument Company on a lot of new control jobs in the sugar industry. It was lots of fun and there was always something doing which helped to counteract the fact that we were all working seven days a week. This messed up any chance of seeing a few football games, but I did manage to get in an occasional round of golf.

"Thus I was looking forward to my four weeks' vacation when I hopped a sleeper for the East on December 14. After spending Friday morning in Los Angeles, I boarded the Santa Fe *Streamliner* shortly after noon. I was feeling fine and ate a good-sized dinner, but during the night a stomach-ache developed, which I blamed on the roast

beef. However, the pain continued all day Saturday until at night I could hardly walk. The nurse on the train advised against eating any solid foods and told me to take it easy and try to get some ice on my side. I changed trains in Kansas City, and the old Wabash landed me in St. Louis the next morning. I don't know whether the ice wrapped in towels did me any good or not, but it sure moistened the berth plenty.

"Sunday I did not feel too badly, so I killed four hours in St. Louis by driving around the burg with friends. At noon I boarded the good old Pennsy, arriving at Philadelphia the next morning. After driving dad to the office, mother and I dropped in to see the family doctor. After a few preliminary pokes in the midsection and a blood count, he called up a surgeon and reserved a room in a near-by hospital. Within an hour I was minus a slightly ruptured appendix. This necessitated my having a nice, big rubber drainage tube sticking in my side, which delayed things considerably. But after I got off the hot tea and broth diet, it was not so bad being sick. The nurses were nice, too — a blonde during the day and a brunette at night. I was allowed to go home the day before New Year's, just in time to celebrate by hitting the hay at 9:00 P.M.

"While I was in the hospital, Charley Hanley dropped down from New York. He was still with Gibbs and Cox then, but when I saw him later in New York, he told me he had landed a new and better job with the Navy Department there. Ted Pomeroy is still working for American Sugar at their Franklin Sugar Refining Company plant in Philadelphia. We went to a basketball game together and spent most of the time chewing the fat about Tech and the sugar business. Ed Halfmann '36 stopped by one evening to say that he was in Philly, working for the Philadelphia Electric Company, where he was taking a training course.

"After a couple of weeks of loafing around home, I was able to navigate sufficiently well to take a few short trips, including one to Boston to see how the old dump looked. After a visit at United Fruit's Revere Sugar Refinery, I landed at Tech in the late afternoon. I wandered around Walker and the dorms where the only bennies I knew were the janitors and the porters, and then over to the hangar gym to be greeted by Jim, faithful guardian of the lockers, and little Oscar, that demon coach of track. I stayed all night with Dave Dale, who is living in Cambridge near Central Square and working for the Gamewell Company, a manufacturer of fire-alarum systems. Dave is a handy man for them because, as you may remember, he was the dorm watch repairer. After his experience with watches it's a small matter to take apart a fire-alarum system and put it back together again.

"That night we ate in Childs's 'Old France,' which brought back many memories, including one concerning a friend of ours who had an unfortunate experience there with hearts-of-lettuce

1935 Continued

salad. Much to his embarrassment, a parade of kitchen help armed with mops was required to repair the damage! Later in the evening, after we returned to Cambridge, Al Fletcher and Bill Nichols '36 and his wife dropped in for a visit. Al and Bill are both working for Bethlehem Shipbuilding down at Fore River. Forsburg is there, too, as some sort of inspector, and Ham Dow had just left for a job with the Navy Department. It looks like the boys are beginning to follow Tubby Rogers' latest advice and pile on the gravy train with Uncle Sam.

"The next day was spent wandering around Tech, where I saw a bunch of the old professors still dishing it out as of yore. I had lunch in Walker (same old chicken croquettes) with H. P. McCarthy. His basketball team had been doing fine, having won six out of the seven games. He said he had been 'building character' for the last couple of years, and it felt good to win a few again. I saw 'T. C. DAUPHINÉ' on a door in Building 4 and upon investigation discovered Tony himself, who is an instructor in chemical engineering. A little farther down the hall in the Eastman Lab, I thought I saw a familiar face peering out of a maze of intricate apparatus, and sure enough it was Walter Hugo Stockmayer's. He was in the midst of work for the doctor's degree which he expects to pull down sometime soon. Then he plans to instruct at Tech for awhile. Just across the hall I spied Leo Epstein, also in pursuit of more knowledge.

"The old place looked about the same except for the new Rogers Building, which really is a beaner. Gone is the old entrance 69 and in its place is the new building with a little dome to match the big one. Up in the machine tool lab, Bowley, Lawson, and all the boys were still on hand, while good old 3-440 with its shades of 8.01 finals was still the same. After dinner in Boston at El Seville and a whirl around the town, I left on the sleeper for New York.

"There among other things I stopped in at Grant Photos to see Vice-President Pete, but as it was only 9:30 A.M. the girl was very much surprised that I should be asking for him and replied that Mr. Grant wouldn't be in until later. Then I went down to Babcock and Wilcox where I had a chat with Hart Livingston. Several months before, he had flown home to California for a short vacation. He was all ready to go back again with me. Ernest Dockstader, who was a graduate student with our Class and who spent a year in Panama with me, also worked for Babcock and Wilcox. After this I took the subway out to the World's Fair grounds and walked around a bit to compare it with our own San Francisco Fair here on Treasure Island. The New York one will be considerably larger and gaudier, but I believe the one here will be prettier and more interesting. So come on out this summer and give a look.

"I headed back West about the end of January, via Rochester, Detroit, Chicago, the Burlington Zephyr to Denver, Ogden, Los Angeles, and finally to Salinas.

Rochester besides stopping at the Taylor Instrument Company, I saw George Valley, who is now teaching and getting his doctor's degree at the University of Rochester. He started out with Bausch and Lomb, but the old urge of the campus and physics lab at the university got him and soon he was spending all his spare time there. It was not long before he was a member of the staff and teaching freshman physics.

"And here I am back in Salinas, a little burg of about 15,000 surrounded by miles of lettuce and sugar beet fields. It's only 100 miles south of San Francisco on the regular coast highway to Los Angeles, so when any of you are out here for the fair this summer, don't forget to look me up." — In a postscript Don also mentioned that Dick Brown, II, is still in Cristobal, Canal Zone. Some letter, Don; let's hope others follow your example. — We close with the thought we wish you to bear in mind: A class get-together is scheduled for June 5, Alumni Day, 4:30 P.M., at the University Club, 40 Trinity Place, Boston. Let's see you there. — ROBERT J. GRANBERG, *General Secretary*, Central Y.M.C.A., 100 Gibbs Street, Rochester, N.Y. RICHARD LAWRENCE, *Assistant Secretary*, 111 Waban Hill Road North, Chestnut Hill, Mass.

1936

One Course seems to monopolize the little bit of news that we have this month. But before presenting that, we have one wedding to announce. Bill Dyer, I, and Miss Ann Quinn were married on February 18 in Lowell, Mass. I might also mention that I met Dick Koegler, XVI, a short while ago. He is still working in structures at the Curtiss airplane plant. Fred Flint and Watt Hamilton '39, both of XVI, are also still with the same company. Fred is connected with the test work and spends most of his time at the Buffalo airport.

Course X. Our news of the month is from Course X. A letter from Don Kenny tells the good news that he is back on the job again. He writes some news about some other members of the group, too: "As you know I have been laid up for quite a while — six months in a hospital and eight months at home — but am leaving for Wilmington on the first of April to resume making better things for better living through chemistry. Recently several Course X men now in and around Boston got together for a bull session at Phil Vincent's Allston apartment. In addition to Phil and myself, the congress consisted of Bill Jordan, Al Klemka, Gus Chandler, and Jack Hanlon, II, and we learned the following: Phil Vincent received his master's degree in chemistry from the University of Illinois in 1937, married one of the college librarians (and a very nice one, too), and is now with Colonial Beacon Oil in Everett. Bill Jordan spent a year in Akron, Ohio, with Firestone and was transferred to the development department of their new Fall River plant last June. Al Klemka is still chasing his doctor's degree in chemistry all over the Institute, and when he catches

up with it, intends to remain as an instructor. Gus is engaged in the same pursuit but intends to get an industrial job. Jack Hanlon is in the Department of Physics at the Institute working on one of those machines with jaw-breaking names, which can deduce anything about a substance from its color. Charlie Holman's wedding (to Miss Priscilla Denison of Buffalo) is set for June 24, and Herb Borden will take the same (mis)step on or about April 1 (to Miss Margaret MacCallum of Taunton). Herb is with Tide Water Oil in New Jersey. Jim Vaughan has a new job with the same company (Standard of New Jersey) and is now attempting to apply lab data to production processes. Jack Sullivan is married, living near Boston, and working as a junior state chemist for Massachusetts. Lou Young is another one who is back at the Institute; he is doing statistical analysis for the Mathematics Department. It will interest the X-A men of 1937 to know that Jack Walter and Tony Antonio are finishing their doctor's theses; Jay Seebold is director at the Parlin, N.J., M.I.T. Practice School station; Iggy Akeroyd was married to the belle of Stoke-on-Trent a year ago and is working in London. Tiger Parekh has returned to India and is working in a paper mill there." — Thanks for the letter, Don. It will be recalled that Don had a long siege of trouble with his knee. He works with the ammonia division of the Du Pont Company.

The other letter this month was from Jerry Chapman, who writes to tell that again the news about his position didn't get into print until after he had gotten a new job. He left the temporary job he had with Bauer and Black for a somewhat more permanent position with the Portland Cement Association, with offices and laboratory in Chicago. A couple of months ago, Martin Gilman, VI-A, was in Chicago on a month's business trip for his firm, General Radio, and Jerry saw quite a bit of him then. Jerry attended a meeting of the Technology Club of Chicago and was disappointed to find only seven present from the Classes of '36 and '37. Although he didn't know any of them he says, "None of us stood on formality." — I am still accepting letters from any members of the Class at the following address. — ANTON E. HITTL, *General Secretary*, 491 Ashland Avenue, Buffalo, N.Y. ALLEN W. HORTON, JR., *Assistant Secretary*, Room 3-208, M.I.T., Cambridge, Mass.

1937

From Plainfield, N.J., to near-by Brunswick comes a note from Rupert Lewis, who says he was very angry at having no notes in The Review for so long. Can't say that I blame you, Rupert, but I had tired of writing about myself and works, which was all there was to write about. Rupert is with the Cornell-Dubilier Electric Corporation in Plainfield. He says: "I've been with this company since July, 1937. Spent until January knocking around the plant in training, then went to work for the chap who did

You will find on page 1 information on Alumni Day, June 5

all the cost estimating. When he died in May, the job was dumped into my lap and has stuck there. Professor Schell's [12] advice was to get your desk within 100 feet of the boss's, and I have done better than that: All I need do is lean back on one leg to put a report in his basket. The only trouble is that he is seldom at his desk. We're just a small company anyway. I don't doubt, however, that many of the boys are using our capacitors, either knowingly or otherwise.

"Bob Vogeler was also with this company, and the two of us shared an apartment from last May to the middle of November. Had a pretty good time, but he was sent to Europe in a deal of our outfit with International Standard Electric Company. He is at present living in Antwerp, Belgium, and spends his time there with Bell Telephone Manufacturing Company, when he isn't traveling to Zurich, Paris, or Brussels. He is known, so he tells me, as a condenser expert. Just what he is doing, he hasn't said, but I believe it's primarily sales and sales-promotion work. We were both very much stricken by the twist of fate, or something, which threw us into heavy responsibility so soon after starting. I know that Bob Reichart will be interested about Vogeler."

"Thank you very much, Rupert; that type of letter is always welcome although very scarce. Most of the news I get from clippings concerns engagements and weddings, like two before me now: Miss June Wheelwright of Cohasset and Dave Fulton have decided that together they will be better off, as have also Sidney Sussman and Miss Ann Rosenberg of Brooklyn, N.Y. — Dave McLellan tells me of a few comings and goings to close this: "After moving all over eastern New Jersey, Rich Gidley has finally settled down at 140 South Burnett Street, East Orange. Norm Matthews has been transferred from the National Tube Company to the research laboratory of United States Steel Corporation in Kearny, N.J., temporarily. Al Haskell has left the Carnegie-Illinois Steel Corporation and is now working in the plant making some very fine tool steels." — Remember Alumni Day, June 5. — WINTHROP A. JOHNS, *General Secretary*, 245 Hale Street, New Brunswick, N.J.

1938

Engagement and wedding announcements are still pouring in on us (and we trust they will continue to do so for some time), so we will pass on those bits of news first. On March 18 a good many of Newt Hammond's friends gathered in Brookline for his marriage to Miss Hilda Morrison of that city. Hammy and his bride are making their home near Camden, N.J., where our classmate is employed by the Campbell Soup Company. Armand Cloutier, VI, was married on January 22 to Miss Helen Abrams of Milford. By the time these notes will have gone to press we suspect that Howard Milius, X, will be married to Miss Hope Ellis of Boston and will be living in

Bridgeton, N.J. We also read of the marriage of Geoffrey Martin to Miss Barbara McIlhenny of New Orleans. The ceremony took place on January 6 in Charleston, S.C. Geoffrey is now studying medicine at the University of North Carolina.

Herb Wiley, II, is engaged to Miss Edith Sanford of Lawrence, a graduate of Simmons; Wendell Jacques, IV, is engaged to Miss Ruth Wiley of Wollaston; Morris Beckman, who did graduate work in Course IV, is engaged to Evelyn Noren of Chicago; John Toy, X, is engaged to Miss Elizabeth Halligan of New Orleans, a graduate of Katharine Gibbs School in Boston. We were also glad to hear of the engagements of Miss Dorothy Sleeper of Swampscott to Samuel Swasey, XIII; Miss Marie Connors of Belmont to Tom Oakes, XVII; Miss Winifred Hutchings of Roslindale to Fred Dakin; Miss Caroline Stambaugh of Greenfield, Mass., to Steve du Pont; and Miss Marion Silver of Beverly, Mass., to Louis Fireman. The very best of luck to all of them.

Your Secretary has just received something else that is too good to keep till later in the notes — a letter from Dick Muther, XV, who, as you know, is at Robert College in Istanbul, Turkey. He writes that he had no Christmas holiday, "but after midyear exams I spent a grand ten days in Rumania. I got in some skating and hockey on the outdoor artificial ice rink in Bucharest, saw some movies in English for a change — at Istanbul they are all in French — and generally took in the city and what goes with it. (He did not elaborate further! — *Secretary*.) I managed also to spend three days skiing in Lower Transylvania. There was plenty of snow there, though wind blown and hard packed." Dick complains of trying to hunt one day with a rather scholarly dog, one that understood only Greek! He describes the people of Turkey as "very nice, though rather slow and inefficient and not always too clean. . . . The men use perfume and even have their hair waved. . . ." The famous harem, he reports, has been a thing of the past for 15 years. He goes on in a different vein to say: "The government has broken the bonds of (the people's) religion, and the people are making rapid progress in industry, education, national defense, road construction, sanitation, and all kinds of public works. They all attribute the change to the late Kamal Atatürk." Well, 'at a Turk, Dick — We're looking forward to hearing from you again.

And speaking of fellows who took jobs outside the United States, there is Bob Elliott, IX-B, who reports that he is with Pan American Airways in Cristobal, Canal Zone. He went down there as a trouble shooter after spending six months in the P.A.A. shops at Brownsville, Texas.

We hear from Al Bates, the Course XIII Secretary, that Bill Gibson is working for the Union Barge Company, a subsidiary of Dravo, in Pittsburgh. Al, who also works for Dravo, has been learning some of the welding game. He says: "I find it more interesting than drafting and I get a chance to go around

the plant and keep in touch with the work as it progresses, as well as getting to know the various foremen, A.B.S. surveyors, navy inspectors, and what not. I have to take care of the details of testing welders, including studying the requirements, getting the material and other necessities through the shop, assisting with the testing, and expediting the whole works."

Ken Gunkel reports for Course II as follows: "Herb Wiley is working for the Goodyear Tire and Rubber Company as a member of the 'Flying Squadron' which serves as a training ground for their personnel. At present he is located in Jackson, Mich., where the company has a plant. He expects to be transferred to Akron some time this spring but says nothing definite about it. Herb says he likes the work very much, although it requires that he be on call for any job at any time without 'batting an eyelash.'"

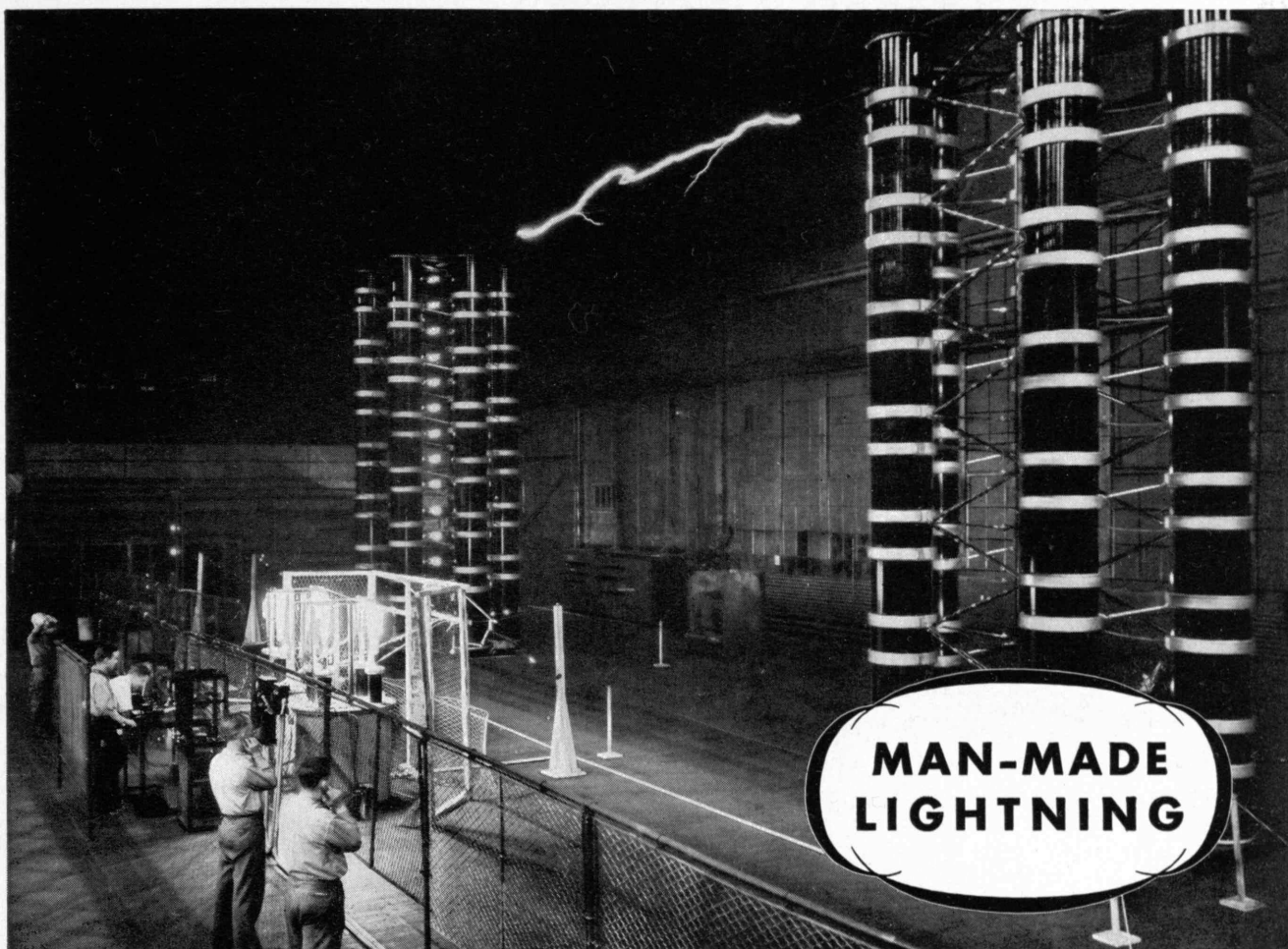
"George Morel is working for the Builders Iron Foundry Company in Providence, R.I. Bob Sessler is with the United Fruit Company as a refrigeration engineer on one of their boats, and Jim Maguire, past President of the American Society of Mechanical Engineers, student branch, is connected with the Boston Edison Company. Cy Scalingi is reported to be working as a refrigeration engineer in Cambridge. Pete Heintz is working for Allis-Chalmers in Milwaukee."

About himself, Ken says: "Today I pitched pig iron into the cupola (at the Babcock and Wilcox plant) for nearly eight hours, and it was sure a back-breaking job, particularly after having shoveled sand all day yesterday and most of the day before. . . . We are all moving to New York the first of May, and I am planning on coming to Boston the following week-end." We hope to see you, Ken, and thank you for your splendid work.

From Bernard Lement, XIX, comes the following news: "My work at the New York Testing Laboratories consists for the most part of metallurgical consulting problems which are sent in by various companies in New York and New Jersey. However, I have a hand in the electrical, chemical, and mechanical tests that come in also. . . . Harold McCrensky, IX, is working for the Peninsular Grinding Wheel Company in Detroit, and John Guttel landed a job with the Horton-Angel Company in Attleboro."

We heard in a rather roundabout way that Phil Sellers, XV, is with the Standard Oil Company of Indiana in Whiting. His biggest trouble seems to be in maintaining two millimeters of vacuum in his assays on topped crude. Word also comes that Jack Phillippi, I, is with Budd in the city of Brotherly Love (Philadelphia, to the fellows in the West).

Your Secretary wants to thank Martin Cines, X, for his correction of our impression that he was at Wisconsin. The fact is, Martin is at the University of Minnesota. — DALE F. MORGAN, *General Secretary*, M.I.T. Graduate House, Cambridge, Mass. LLOYD BERGESON, *Assistant Secretary*, 885 Beacon Street, Newton Centre, Mass.



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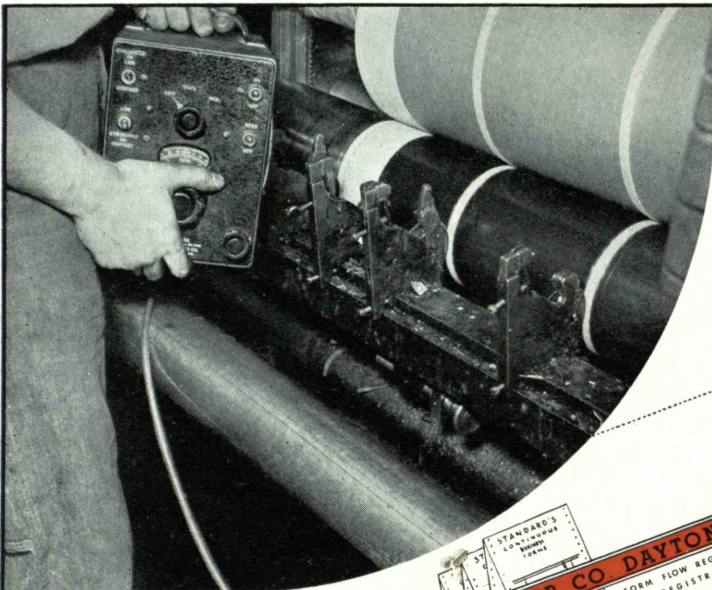
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